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RILEY RIDGE
NATURAL GAS PROJECT

RECORD OF DECISION

JANUARY 1984

DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
DEPARTMENT OF AGRICULTURE
FOREST SERVICE

March 3, 1849

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Wyoming State Office
2515 Warren Avenue
P.O. Box 1828
Cheyenne, Wyoming 82001

IN REPLY
REFER TO:

Dear Reader:

Enclosed is the public record of decision for the Riley Ridge Natural Gas Project. It is provided for your information and use.

This document, in compliance with the National Environmental Policy Act, outlines the decisions and rationale (management considerations) for the analysis presented in the Riley Ridge Project Environmental Impact Statement (EIS).

Key management considerations, required environmental impact mitigation measures, and compliance and monitoring requirements are described.

A comment period is not required by regulaton for decision documents. However, any comments you may have would certainly be welcomed. Comments should be directed to Donald H. Sweep, District Manager, Bureau of Land Management, P.O. Box 1869, Rock Springs, Wyoming 82902-1869, or Reid Jackson, Forest Supervisor, Bridger-Teton National Forest, P.O. Box 1888, Jackson, Wyoming 83001.

RD Leonard
Acting State Director

#10527018

ID: 88074192

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RECORD OF DECISION
FOR
RILEY RIDGE
NATURAL GAS PROJECT

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Prepared By

U.S. Department of the Interior
Bureau of Land Management

U.S. Department of Agriculture
Forest Service

January 25, 1984

RECOMMENDATION:

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DISTRICT MANAGER, ROCK SPRINGS

Jackson
FOREST SERVICE
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DECISION:

B D Leonard
BUREAU OF LAND MANAGEMENT
STATE DIRECTOR, WYOMING

FOREST SERVICE
for REGIONAL FORESTER, INTERMOUNTAIN REGION

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ATTACHMENTS

Attachment A - Memorandum of Understanding Between the Bureau of Land Management (BLM) and the Forest Service (FS) for Management of the Riley Ridge Project.

Attachment B - Required Federal Measures and Applicants' Standard Operating Procedures Designed to Reduce Environmental Impacts.

- B.1 - Applicants' Standard Operating Procedures
- B.2 - Federal Regulations: Terms and Conditions
- B.3 - Current Lease Stipulations on Occupancy
- B.4 - Well Field Oil and Gas Operating Measures
- B.5 - General Measures
- B.6 - Roading Guidelines for Gas Exploration and Development Within the Riley Ridge Project Area
- B.7 - Erosion Control, Revegetation, and Restoration Guidelines
- B.8 - Required Federal Mitigation Measures
- B.9 - Sour Gas Trunk Line Mitigation Measures

Attachment C - Finding of No Significant Impact (FONSI) Riley Ridge Natural Gas Project, Sour Gas Pipeline Alternatives.

Supplemental Environmental Assessment to the Riley Ridge Natural Gas Project FEIS - Sulfur Gas Pipeline Alternatives.

Attachment D - Application for Permit to Drill (APD) Environmental Reference Report and Decision Record.

Attachment E - Public Comments Received on the Riley Ridge Final EIS

Attachment F - MAPs

- -Map S-1 - Riley Ridge Natural Gas Project Record of Decision (North 1/2)

- - Map S-2 - Riley Ridge Natural Gas Project Record of Decision (South 1/2)

- - Map 1 - Sour Gas Trunk Line-Proposed and Alternative Alignments.

RECORD OF DECISION
RILEY RIDGE NATURAL GAS PROJECT

I. SUMMARY

INTRODUCTION

This record of decision (ROD) is for the Riley Ridge natural gas development project which includes the construction, operation, maintenance, and abandonment of a deep gas well field in western Wyoming, gathering lines for the transportation of sour gas within the well field, trunk lines for shipment of sour gas from the well field gathering system to the treatment plants, the treatment plants, sales gas pipelines for delivery of sales gas to existing gas transmission pipelines, and facilities for the handling and transportation of by-products (sulfur and carbon dioxide) to markets. The project represents three individual projects proposed by:

1) Northwest Pipeline Corporation and Mobil Oil Corporation
2) Exxon Company, U.S.A.
3) American Quasar Petroleum Company and Williams Exploration Company.

The applicants have applied to the U.S. Department of the Interior (DOI), Bureau of Land Management (BLM) for right-of-way permits to cross federal land managed by the BLM and Forest Service (FS). An environmental impact statement (EIS) was prepared jointly by BLM and FS. The BLM assumed the administrative lead and was responsible for filing the EIS with the Environmental Protection Agency.

In addition to the proposed project, numerous component alternatives and siting alternatives have been evaluated. These include a sulfur transport alternative, power supply alternative, and employee housing alternative; and the Buckhorn, Shute Creek, and Northern sour gas treatment plant siting alternatives; as well as a No Action Alternative.

DECISION SUMMARY

Based upon the analysis of environmental consequences described in the Riley Ridge Natural Gas Project Environmental Impact Statement, and in consideration of all public, state and federal agency, and industry scoping, hearing, and written comments received, the BLM and FS have jointly identified the Agency Decision to be a modification of the Shute Creek Alternative. The Shute Creek Alternative is modified to the extent that the East Dry Basin plant site is preferred to the Buckhorn plant site. Therefore, plant sites would be Craven Creek, Shute Creek, and East Dry Basin.

Due to differences in agency policy, the Forest Service decisions (i.e., well field roads, powerlines, pipelines, mitigation measures, etc.) are subject to a 45-day administrative review period beginning on the date the ROD is signed. The BLM decisions are not subject to administrative review and therefore may be implemented immediately following the ROD, provided all the preauthorization (i.e. construction and use plans, etc.) requirements are met.

The federal, state, county, and local actions that would be required to implement any of the applicants' proposed projects would generally be the same regardless of the location. These actions are listed in Tables 1-1 through 1-3 (federal actions, state actions, county and local actions) in the DEIS.

As part of the process of issuing the various required authorizations, the agencies require compliance with standard procedures and measures to mitigate potential impacts. These required measures are identified in Attachment B and would be required regardless of the designs of the proposed projects.

The BLM and/or FS will grant or renew use authorizations (i.e., rights-of-way, leases, applications to drill, temporary use permits, etc.) in accordance with the provisions of appropriate federal regulation for the public lands and resources under their respective administrative jurisdiction.

Applications for permit to drill (APDs) will be reviewed by the appropriate BLM or FS field office where site-specific mitigation measures will be attached and forwarded to the BLM Rock Springs District Office for approval.

Amended right-of-way (ROW) applications will be required from the applicants before further processing may take place. Subsequent to receipt of an amended application, construction and use (CU) plans (see page 1-12 of the DEIS), incorporating the mitigation measures appended to this ROD, will be required. The CU plans will be submitted to the issuing office for approval.

Review of the approved APDs or CU plans can be arranged by contacting the appropriate issuing office.

For ROWs on BLM administered lands contact:
    Rock Springs District, Pinedale Resource Area Manager (307-367-4358)
    Kemmerer Resource Area Manager (307-877-3933).

For ROWs on FS administered lands contact:
    Bridger-Teton National Forest, Big Piney District Ranger
    (307-276-3375).

For APDs approved on BLM or FS administered lands contact:
    Rock Springs District Office, Division of Mineral Resources
    (307-382-5350).

AREAS OF CONTROVERSY

Several concerns about the Riley Ridge Project were raised during public scoping meetings and subsequent DEIS review. The most significant issues raised were socioeconomics, wildlife, air quality, and health and safety. Specifics relative to these issues are discussed under Section IV - Management Considerations.

ISSUES TO BE RESOLVED

Implementation of the proposed project would be dependent upon resolution of issues in three areas: socioeconomics, air quality, and water resources. These issues would be resolved in the permitting processes of the Wyoming Industrial Siting Council, the Wyoming Oil and Gas Commission, and the Wyoming Department of Environmental Quality, and the BLM-Mineral Resources Division. The issues for which resolution is expected are discussed below.

Socioeconomics

The Proposed Action would have significant adverse impacts on housing and local public services. Additional housing units and public services would be needed as a result of the increased population to the study area. A schedule and definite plan for meeting these project-generated needs would be required by the Wyoming Industrial Siting Council as part of its permit process. Permission to proceed with project construction would be dependent upon acceptance of a required mitigation plan.

Air Quality

The potential problem associated with Quasar's predicted violation of the SO_2 24-hour average PSD Class II increment (based on use of off-site meteorlogical data) would have to be resolved during the PSD permitting process.

Quasar's plant also shows predicted violations of the Wyoming half-hour H_2S standards. Resolution of this problem would be identical to that for SO_2.

The Exxon and Northwest plants will undergo similar review as part of the PSD permitting process. On-site meterological data would be used by the Wyoming Department of Environmental Quality to verify the results found in the EIS (e.g., no significant impact). If the on-site data showed problems of compliance with PSD increments or air quality standards, that issue would have to be resolved by installation of additional plant emmission controls or other appropriate modifications.

Resolution of these issues must be achieved before granting the PSD permit and approval to begin project construction.

Water Resources

The effects on groundwater of deep well reinjection of waste water from the sour gas treatment plants and well field dehydrators have not been fully analyzed due to lack of information on the applicant's injection engineering plans and specific water resources data. Prior to allowing its activity on or off the proposed plant sites, the BLM will require further analysis of impacts. In addition, the Wyoming Oil and Gas Conservation Commission, Wyoming Department of Environmental Quality, and BLM-Minerals Resources Division must review and approve the applicants' disposal plans. The necessary permits or approvals would be required before the applicants could begin drilling new injection wells or injecting in old oil or gas wells.

II. STATEMENT OF DECISION

Based upon the analysis of environmental consequences described in the Riley Ridge Natural Gas Project Draft Environmental Impact Statement (DEIS) and Final EIS (FEIS), and in consideration of all public, state and federal agency, and industry scoping, hearing, and written comments received, the BLM and FS have jointly identified the Agency Decision to be a modification of the Shute Creek Alternative. The Shute Creek Alternative is modified to the extent that the East Dry Basin plant site is preferred to the Buckhorn plant site. Therefore, plant sites would be Craven Creek, Shute Creek, and East Dry Basin.

The Agency Decision was selected on the basis of the comparative analysis presented in Section 2 of the FEIS and the ultimate impacts which would result from the implementation of this Alternative with all applicable mitigation. The Agency Decision would have fewer overall adverse impacts to resources than the other alternatives considered. Implementation of the Agency Decision would be subject to the mitigation measures identified in Attachment B. Other measures subsequently identified and deemed necessary by the Authorizing Officer may be added.

All practical means to avoid or minimize environmental harm have been adopted. Intensive inspection and enforcement to ensure that the decisions are carried out in accordance with required mitigation will be performed.

The BLM and FS have entered into a Memorandum of Understanding (MOU) (Attachment A) that establishes agreement and procedure for overseeing implementation of the Riley Ridge ROD. This includes review and quality control of required applicant plans for associated construction, operation, maintenance, and termination of proposed facilities and well field development.

The applicants will be required to develop a comprehensive monitoring program which will be approved as a part of the required applicant CU plans. They will be required to implement and/or fund, at least in part, the monitoring identified in Section VI of this ROD and Appendix E of the FEIS. Specifically, monitoring of groundwater, air quality related values, and fisheries and surface water quality (Attachment B.5 measures W-1 & 2; AQ-1 & 2; WF-13. FEIS Appendix E-1; E-2; E-3).

Under the terms of the Endangered Species Act, the applicants will be required to conduct surveys, no more than one year prior to disturbance, to determine if listed plant or animal species or their habitats might be present on areas to be disturbed, regardless of land ownership (Attachment B.5, measure 27).

The applicants will also be required to develop a cultural resources plan to locate cultural resources which would be directly affected by the project. A class III field survey would be used in locating these resources (Attachment B.5, measures 43 through 46).

As a result of any applicant delays in their project plans, the cumulative impacts associated with the Riley Ridge Project, or other planned or proposed projects would be reevaluated prior to granting any of the requested Federal actions to determine if they are still within the parameters considered in the EIS.

A description of the Riley Ridge Project components and associated actions as they would be permitted for each applicant follows. The "Decision Rationale" is provided in Section IV, pages 26 through 33.

WELL FIELD

Before any development activity occurs within the well field area, each lessee or unit operator would be required to submit an APD. The process for issuing APDs is described in the DEIS on pages 1-3 and 1-12. and more specifically will follow the procedure outlined in Attachment D, "Application for Permit to Drill (APD) Environmental Reference Report and Decision Record". Approval of an APD would include site-specific application of the mitigation measures (Attachment B) to well siting, access roads, pipelines, powerlines, and other associated facilities. A description of the lease operator activities that would require issuance of an APD by the BLM is summarized by applicant in the DEIS (pages 1-35 and 1-36).

Forest Service

The Bridger - Teton National Forest administers 34 percent of the 159,928 acres of well field surface. Use authorizations (i.e. ROWs, leases, permits) for roads, powerlines, pipelines, well site facilities, etc. will be handled through the normal APD process as long as the facilities remain on-lease. On-lease facilities constructed by the unit operator will not require individual (separate) use authorization. However, if the facilities on the lease area are constructed by or transferred to a third party then the third party must have an individual use authorization. Any facility (i.e., road, powerline, pipeline, etc.) off-lease will require individual use authorization. All Forest Service use authorizations will be issued by the Forest Service Supervisors Office, Jackson, Wyoming.

Bureau of Land Management

The Rock Springs District of the Bureau of Land Management administers the balance, 66 percent, of the well field surface acres. The same use authorization procedure will be followed as described for the FS. Individual use authorizations will be issued by the BLM Pinedale Resource Area Office of the Rock Springs District.

TREATMENT PLANTS

Air Quality

The State of Wyoming is responsible for assuring compliance with all air quality standards and regulations, including the requirement of Best Available Control Technology (BACT). The potential problem of Quasar's predicted violation of the SO_2 24-hour average PSD Class II increment (based on use of off-site meteorological data) would have to be resolved during the State's PSD permitting process. Resolution of this problem is potentially a two-step process. The first step would be to remodel Quasar's SO_2 impacts with on-site meteorological data. (This would simultaneously resolve the problem of results based on off-site meteorological data.) If violations are still predicted, the second step would be for Quasar to install additional in-plant sulfur controls or other options they may develop. Quasar's plant also shows predicted violations of the Wyoming half-hour H_2S standards. Resolution of this problem would be identical to that for SO_2.

The Exxon and Northwest plants will undergo similar review as part of the PSD permitting process. On-site meterological data would be used by the Wyoming Department of Environmental Quality to verify the results found in the EIS (e.g., no significant impact). If the on-site data showed problems of compliance with PSD increments or air quality standards, that issue would have to be resolved by installation of additional plant emmission controls or other appropriate modifications.

Resolution of these issues must be achieved before granting approval to begin project construction.

Treatment Plant Location

Quasar

The East Dry Basin plant site is approved. The East Dry Basin site is comprised of 640 acres in Sections 34 and 35 of T. 29 N., R. 112 W. and Section 4 of T. 28 N., R. 112 W., Sublette County, Wyoming. See Map S-1 for location.

Northwest

The Craven Creek plant site is approved. This site is comprised of 640 acres in the E 1/2 of Section 29 and W 1/2 of Section 28 in T. 22 N., R. 113 W., Lincoln County, Wyoming. See Map S-2 for location.

Exxon

The Shute Creek plant site is approved. This site is comprised of 640 acres in section 14 of T. 22 N., R. 112 W., Lincoln County, Wyoming. See Map S-2 for location

TRUNK LINES

Approximate sour gas trunk line alignments are indicated on Maps S-1 and S-2. Portions of the alignment have changed from that considered in the DEIS and FEIS. Since the changes were considered to be outside the general 1-mile corridor analyzed in the DEIS-FEIS, a supplemental environmental analysis was conducted and it was concluded that the additional sour gas pipeline routes as mitigated would not have a significant impact on the human environment. Therefore no supplemental EIS is necessary. The analysis is documented in a supplemental Environmental Assessment (EA) in Attachment C. The final specific alignment location will be determined during the preparation of the CU plans.

1. Pipeline Alignment

Quasar and Williams

Quasar's trunk line from the Darby Mountain, Riley Ridge and North Riley Ridge Units, and Williams trunk line from the Sawmill Area would join in Section 18, T. 29 N., R. 113 W.. A 10-mile trunk line would run from the well field to the East Dry Basin plant site.

Northwest and Mobil

Northwest would purchase gas from Mobil at the wellhead. Northwest's trunk line from the Tip Top and Hogsback Units would begin in Section 20 of T. 28 N., R. 113 W., at their Big Piney Compressor Station. Three other gathering lines from the Hogsback Unit would tie in to Northwest's main trunk line off the well field in Sections 5 and 21 of T. 27 N., R. 113 W., and Section 3 of T. 26 N., R. 113 W.. Northwest's trunk line would be approximately 40 miles long, terminating at the Craven Creek plant site.

Exxon

Exxon's trunk line from the Lake Ridge, Fogarty Creek, and Dry Piney Units, and the Dry Piney Annex would begin in Section 1 of T. 27 N., R. 114 W. The trunk line would be approximately 37 miles long, terminating at the Shute Creek plant site.

Northwest's and Exxon's sour gas pipelines would parallel each other for approximately 18 miles south to the south side of Fontenelle Creek. In Section 2 of T. 24 N., R. 113 W., the two pipelines separate with Exxon's pipeline trending southeast approximately 16 miles to the Shute Creek plant. Northwest's pipeline trends southwest approximately 19 miles to the Craven Creek plant (see Maps S-1 and S-2).

The Holden Hill alignment of the sour gas pipelines (Sections 23 and 26 of T. 25 N., R. 113 W.) will be along the west side of the western-most existing pipeline of Northwest Pipeline Company. This adjustment of approximately three-fourths of a mile west is made because of the highly sensitive Emigrant Trail (Sublette Cutoff) and other cultural values occuring in this area.

In the area of the LaBarge Creek crossing, three options remain open to Northwest and Exxon for aligning the sour gas pipelines through the existing residences (H_2S sensitive receptors) while maintaining the Health and Safety requirements of mitigation measure H-4 (see Attachment B.8).

> Option one is to cross LaBarge Creek approximately 3/4 of a mile west of Northwest's western-most existing pipeline along the section line common to sections 26 and 27 of T. 26 N., R. 113 W. (see Map S-1). Approval of a crossing following this alignment is contingent upon consumating a sensitive receptor purchase agreement and obtaining two sensitive receptor variances.
>
> Option two is to cross LaBarge Creek approximately 1.5 miles west of Northwest's western-most existing pipeline in the west 1/2 of Section 27 of T. 26 N., R. 113 W. (not shown on Map S-1). Approval of a crossing following this alignment is also contingent upon consumating a sensitive receptor purchase agreement and obtaining two sensitive receptor variances.
>
> Option three is to route the pipelines west of Calpet (1.5 miles) along the toe of the Hogsback and cross LaBarge Creek just east of the narrows in Sections 19 and 30 of T. 26 N., R. 113 W. and then return to the original alignment. This third option would result in approximately two miles of additional pipeline. No sensitive receptor purchase agreement would be required, but one variance would be needed.

If the first option for crossing LaBarge Creek is arranged, then the sour gas pipeline will be required to pass one-mile east of Calpet. If the distance of the pipelines from Calpet is less than one mile at any point then a variance must be obtained from the Authorized Officer (Health and Safety mitigation measure H-4). If the second or third option is selected then the two sour gas pipelines will be located approximately 1.5 miles west of Calpet along the toe of the Hogsback. This would comply with the requirements of the Health and Safety mitigation measure and therefore not require a variance for Calpet.

Two other residential areas (sensitive receptors) will require requests for variances under any of the three alignments. These are Western Camp and Dry Piney Camp.

2. Design Safety Aspects

The presence of the toxic H_2S in the sour gas will require incorporation of numerous monitoring and safety control measures in the design and operation of the gathering and trunk line systems. These include siting considerations, monitoring and shutdown systems, and emergency response procedures.

Siting Considerations

Well production areas and the gas treatment plant locations are fixed; however, pipeline system locations can be adjusted. Proposed pipeline routing must avoid passing closer than 1-mile to existing residences, communities, recreation areas, and businesses. Emergency shutdown or block valves will be required and spaced along the pipeline to assure protection of residents near the gathering system and trunk lines in the unlikely event of a pipeline rupture.

Emergency Procedures

Emergency procedures that will be taken in the event of an accidental release of sour gas (H_2S) will be identified in contingency plans prepared by the applicants. Applicants must prepare an individual site-specific H_2S contingency and evacuation plan for the drilling and completion of each well. This is required by BLM regulation (NTL-10) and each plan will outline steps to be taken to control wells and, if necessary, evacuate the area in the event of a blowout.

In addition, the applicants must prepare a contingency and evacuation plan for the operation of the well field, the pipelines, and the plant facilities. This will identify steps to be taken to control an H_2S gas release from wellheads, gas gathering or trunk lines, or a plant upset during operation. It will include public mass alert and evacuation procedures, and provide for appropriate training to ensure that all personnel have the ability and knowledge to implement the established contingency and evacuation plan.

In the event of a sudden pressure drop, trunk line block valves or wellhead valves would stop the flow of gas, depending on the location of the leak. In addition, wells could be remotely shut-in by plant personnel.

Finally, if the sour gas release could not be contained, company personnel would intitiate evacuation procedures for residents in the vicinity of the hazard.

Design Requirements

No sour gas trunk line will be located closer than one mile to the populated areas or sensitive receptors as identified on Map 2-1 in the FEIS. The applicants must use the best available engineering design (i.e., alignment, block valve type and spacing, pipe grade, etc.), best construction techniques (i.e., pipe depth, hydrostatic testing, etc.), and monitoring plans (i.e., surveillance, warning signs, etc.) as approved by the Authorized Officer to minimize both the probability of rupture and radius of exposure in the event of an accidental pipeline release of sour gas.

A variance from the 1-mile distance may be granted by the Authorized Officer based on submission of a detailed site-specific analysis by the applicant that would consider meteorology, topography, and special pipeline design and/or construction measures. This analysis would ensure that populated areas and sensitive receptors would not be exposed to an increased level of risk.

As part of the CU plan, the applicants will be required to prepare a sour gas pipeline health and safety design, construction, and operation plan for approval by the Authorizing Officer.

Design requirements will reduce both the probability of a rupture and minimize the extent of exposure by sensitive receptors to both discomfort and lethal levels of H_2S in the event of a sour gas pipeline rupture. The probability of rupture can be reduced by such measures as warning signs, burial depth, pipe thickness and grade, while such measures as block valve types and spacing and pipeline alignment would minimize the exposure radius from the point of rupture in the event of an accident. See Appendix B.9 for a discussion of the effectiveness of block valve spacing and resultant exposure distances.

SALES GAS PIPELINES

No alternatives to the proposed sales gas pipeline alignments were considered in the EIS. Comments received on the proposed Quasar and Exxon alignment along the toe of White Mountain, northwest of Rock Springs, rendered this alignment unacceptable because it traversed prime city expansion land. Also, the Exxon line would cross the Seedskadee National Wildlife Refuge; this received adverse comment. Therefore, other alignment opportunities must be identified for Quasar's and Exxon's sales gas pipelines. An environmental analysis will be required before a final route is selected.

Northwest's proposed sales gas pipeline right-of-way is approved. It would connect their treatment plant with Northwest's existing 16-inch line 3-miles to the west of the Craven Creek plant site.

CARBON DIOXIDE (CO_2) GAS PIPELINES

The same situation exists for Quasar's and Exxon's CO_2 pipelines as stated for their sales gas pipelines.

No adverse comments were received on Northwest's CO_2 pipeline. The proposed 27-mile alignment from the Craven Creek plant south to the MAPCO Corridor is approved. However, no right-of-way grant will be issued until the final delivery point is identified.

SULFUR TRANSPORT AND LOADOUT FACILITY

Sulfur, a by-product of H_2S processing in the treatment plants, would be sold as markets are developed. If markets are not identified prior to plant start-up, or if estabished markets are interrupted, sulfur would be stored at the plant sites until it is needed to supply demand.

Quasar

The Agency Decision for transporting produced sulfur is by molten sulfur pipeline. However, since only one alignment has been analyzed, and in consideration of the concerns expressed by the public relative to the sulfur drain locations and the proximity of the pipeline to the Emigrant Trail, additional site-specific environmental analysis would be required before the selection of a final alignment. This process will be initiated when Quasar submits their amended application.

Quasar has stated that they would truck the sulfur produced in their first 400 million cfd processing modules to a loadout facility near Opal, Wyoming. This would amount to approximately 654 tons/day. This method of transportation would not require any action on the part of the BLM or the FS. With the additional processing of 800 million cfd and a production of 1,960 tons of sulfur per day, transportation would be in an above-ground, 54-mile molten sulfur pipeline from the East Dry Basin plant to the terminus near Opal.

The system would be powered by a 69-kilovolt transmission line paralleling the molten sulfur line; the line would receive power from Utah Power and Light Company at the plant site, pipeline midpoint, and loadout facility. Emergency generators to power the heating system would be located at both ends of the pipeline to ensure a source of power should an outage of commercial power occur. See Maps S-1 and S-2 for the general pipeline alignment.

Northwest and Exxon

The rail spur that would service the Craven Creek and Shute Creek plants is the approved means of sulfur transport. Northwest and Exxon would build a railroad spur from the Union Pacific Railroad line to the treatment plants. The spur would extend from a point about three miles east of Opal in a northerly direction about seven miles to Craven Creek and then easterly about 8.5 miles to Shute Creek. See Map S-2 for location. Northwest's and Exxon's respective production at full capacity would be 757 and 2,240 tons of sulfur per day.

POWER TRANSMISSION LINES

Quasar plans to purchase electrical power from Utah Power and Light Company. Electrical power for operation of their treatment plant would require construction of a 75-mile, 230-kilovolt transmission line from the Naughton Power Plant to the East Dry Basin plant. Approximately seven miles of the total distance would parallel an existing transmission line. Tangent structures would be wood pole H-frames. A 69-kilovolt line would run to the sulfur loadout facility. The gas field electrical distribution system would also originate from the plant substation. (See Maps S-1 and S-2 for location).

Power for Northwest's and Exxon's treatment plants would also be obtained fom Utah Power and Light Company's Naughton Power Plant south of Kemmerer. A 230 or 345-kilovolt transmission line would extend northeast from Naughton, paralleling Quasar's transmission line for approximately 15 miles. The main line would then parallel the railroad spur to the plant sites for a distance of approximately 29 miles. Tangent structures would be either wood pole or lattice steel H-frames. (See Map S-2 for location).

TREATMENT PLANT WATER REQUIREMENTS

Quasar and Exxon

Groundwater wells would be used by both applicants for all water requirements (Quasar, 22,010 acre-feet for project life; Exxon, 11,040 acre-feet for project life). Permits for groundwater use must be obtained from the Wyoming State Engineer's Office.

Northwest

The applicant's proposed water pipeline is approved. (See Map S-2 for alignment location). Northwest's treatment plant water requirements (2,400 acre-feet for project life) would be supplied from the Green River. The water pipeline would extend from a reinforced concrete intake structure on the Green River below the Fontenelle Dam to the plant site. The approximate distance would be 12 miles using eight-inch pipe, buried to a depth of eight feet. Water would be stored in a large tank and serve as plant makeup water storage and fire water storage.

PLANT SITE ACCESS ROADS

The applicants' proposed plant site access routes are approved. (See Maps S-1 and S-2 for locations). A 3.3-mile paved access road would be required from the Calpet Road (Sublette County Road 23-134) to the East Dry Basin plant. The Craven Creek plant access road would extend from Highway 240 directly east to the treatment plant. It would be paved and 1.4 miles in length. The Shute Creek plant approved access roads are from Wyoming State Highway 372 and 240, and U.S. Highway 30. A total of 27.5 miles of existing maintained dirt road would be upgraded. Nine miles would pass through private land, while the remaining 18.5 miles are located on land administered by the BLM. Exxon's access from Highway 240 directly east to the treatment plant would be paved and 8.5 miles in length. Access roads to all plant sites would be built to American Association of State Highway Transportation Officials standards.

EMPLOYEE HOUSING

All applicants are required to provide construction camps for employees and contractor housing. If the construction camps are located on public land at a site other than those analyzed in the EIS, additional environmental analysis may be required.

GRAVEL, RIPRAP AND FILL MATERIALS

Required gravel, riprap, and fill materials will be obtained from the right-of-way; commercial sources (which would require transportation to the location), or adjacent lands where permitted by the federal surface management agency or the landowner. (Note: If value of needed material exceeds $5,000, sale must be competitive.) An environmental analysis (EA) will be required if mineral materials are obtained from public lands.

WASTEWATER

The effects on groundwater of deep well reinjection of wastewater from the sour gas treatment plants and well field dehydrators have not been fully analyzed due to lack of information on the applicant's injection engineering plans and specific water resource data. Prior to allowing this activity, the BLM will require further analysis of impacts. In addition, Wyoming Oil and Gas Commission, Wyoming Department of Environmental Quality, and BLM-Mineral Resource Division must review and approve the applicants' disposal plans. The necessary permits and/or approvals will be required before the applicants could begin disposal. See Section VI Monitoring for further discussion of permitting requirements.

GAS VENTING

It is the Agencies' decision to allow the Applicants' to vent CO_2 until an economic market is determined by the BLM. When a market is identified, the CO_2 must either be sold or compensatory royalty will be assessed for the marketable volume. In addition, the helium will be allowed to be vented until such time as the Bureau of Mines makes a final determination regarding its disposition.

III. ALTERNATIVES CONSIDERED

SITING ALTERNATIVES

Three project siting alternatives, the Buckhorn, Shute Creek and Northern Alternatives were analyzed for the Riley Ridge Project. The siting alternatives differ from the Proposed Action primarily in the location of certain plant sites and associated corridors. These alternatives change some aspect of the Proposed Action while keeping other aspects unchanged.

The treatment plants included in the Proposed Action and each Alternative are shown below by company, location, and processing capacity.

Applicant	Site	Capacity (billion cfd)
Proposed Action:		
Quasar	East Dry Basin	1.2
Exxon	West Dry Basin	.6
	Big Mesa	.6
Northwest	Craven Creek	.4
		2.8
Buckhorn Alternative:		
Quasar	Buckhorn	1.2
Exxon	West Dry Basin	.6
	East Dry Basin	.6
Northwest	Craven Creek	.4
		2.8
Shute Creek Alternative:		
Quasar	Buckhorn	1.2
Exxon	Shute Creek	1.2
Northwest	Craven Creek	.4
		2.8
Northern Alternative:		
Quasar	Buckhorn	1.2
Exxon	West Dry Basin	.6
	Big Mesa	.6
Northwest	East Dry Basin	.4
		2.8

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The Agency (BLM, FS) Decision, or as stated in the FEIS the Agency Preferred Alternative, is synonomous with "Environmentally Preferred Alternative". The plant siting alternative of East Dry Basin, Shute Creek and Craven Creek would have fewer overall adverse impacts to resources than the other alternatves considered. See Section IV, Decision Rationale, for further discussion.

COMPONENT ALTERNATIVES

The component alternatives deal with sulfur transport, power supply, and employee housing.

Sulfur Transport

Two methods of sulfur transport were considered. One was to transport sulfur as a molten liquid in a 54-mile long, electrically heated, six-inch diameter pipeline form the northern treatment plants to a loadout facility located on a railroad spur near Opal, Wyoming. An alternative to a molten sulfur pipeline was a railroad spur. A railroad spur constructed to the northern sites would require approximately 91.5 miles of railroad. The southern sites (Craven Creek and Shute Creek) would be serviced by a railroad spur approximately 17 miles in total length.

Power Supply

Three power supply optional routes were analyzed. They are referred to as the Applicants proposed route, the Utah Power and Light route (UP&L) and the BLM route. BLM's routing alternative utilized parts of the applicants and UP&L's systems and was selected on the basis of BLM policy which is to encourage use of existing corridors wherever possible. The BLM route would utilize the exisiting 69-KV corridor.

Employee Housing

Construction camps were considered as options to housing construction employees in local communities. Camp sites were identified for the Proposed Action and the siting alternatives.

NO ACTION ALTERNATIVE

The purpose of this alternative is to analyze impacts which would occur if the Proposed Action or any of its alternatives were not implemented.

The Riley Ridge Project is composed of two categories of authorizing actions, one being the consideration of well field activities as a cumulative total to help facilitate the approval or disapproval of APD actions for approved federal gas leases, and the other the consideration of granting right-of-way permits for proposed sour gas treatment plants and their ancillary facilities. The low-Btu (sour) gas that is drilled for must be processed to be marketable to the consumer, thus the two authorizing actions are interdependent. In addition, wells would probably not be drilled on a large scale if processing facilities were not readily available.

No Action would constitute BLM and FS denial of each of the right-of-way applications submitted by the companies. This would mean that none of the gas treatment plants and ancillary facilities would be built and no action would be allowed in the well field as applied for in the project right-of-way applications. Some wells could still be drilled by operators later submitting individual APDs and the agencies preparing individual environmental assessment for each APD.

Thus, No Action would create three possible alternatives: denial of entire project, denial of treatment plants, and denial of one or more of the proposed treatment plants. The following discusses these in more detail.

Denial of Entire Project

The blanket denial of the entire project, treatment plants, ancillary facilities, and well field activities would prevent project proponents from constructing gas treatment facilities and from developing their lease rights (as stated in the Minerals Leasing Act of 1920, as amended).

Denial of Treatment Plants

Denial of the treatment plants, as applied for, may still allow for some low-Btu gas to be drilled for on an individual APD environmental assessment basis as currently occurs, including application of standard agency stipulations and specific mitigation developed in the environmental assessment.

Upon denial of treatment plant right-of-way applications, the companies might have the following options, among possibly others.

1. Find other possible plant site locations in the regional vicinity which might be more acceptable;

2. Transport sour gas out of the project region for treatment;

3. Transport sour gas to the Carter Creek or Whitney Canyon plants.

These possibilities were investigated and the following conclusions were drawn. The first option is real and would have to be analyzed in the event of new right-of-way applications. The second option appears to be impractical for several reasons, including high costs of long distance transport of gas, no known plants which have capacity to treat this kind of gas, hazards and lack of technology of long distance sour gas transport. The third option is not possible because the Carter Creek and Whitney Canyon gas treatment facilities do not have the necessary equipment and treatment process to remove the amount of CO_2 found in the Riley Ridge sour gas. In addition, they currently lack sufficient capacity.

Consequently, the above options were dropped from further consideration in the EIS.

Denial of One or More of the Proposed Treatment Plants

Another possible scenario under the "denial of treatment plants" would be the denial of one or more of the proposed plants or the alternative plant sites. This is a real possibility which could occur if there were adverse environmental or social impacts which could be avoided by such a denial.

The Proposed Action constitutes a "worst-case" or maximized development and implementation impacts analysis of various companies' proposals. Denial of specific plant proposals would result in fewer total impacts. The EIS addresses impacts of the various proposed projects which make up the Proposed Action.

Because the various portions of the Proposed Action are analyzed separately, sufficient analysis is provided in the EIS to allow selection of parts or denial of parts of the Proposed Action, thus no further analysis of this scenario is necessary.

ALTERNATIVES CONSIDERED BUT ELIMINATED

Treatment Plant Siting Scenarios

As part of their applications to the BLM, Quasar, Exxon, and Northwest/Mobil each presented a proposed treatment plant site and two alternative sites.

Various combinations of these sites would yield over 30 possible development scenarios, each processing 2.8 billion cfd of sour gas. Since it was not practical to analyze each of these scenarios in detail, certain alternatives were identified by the agencies and applicants which would provide a comprehensive analysis of potential impacts.

The results of initial air quality modeling conducted by Environmental Research and Technology, Inc. (ERT) indicated that Quasar's production capacity of 1.2 billion cfd at the East and West Dry Basin sites would violate air quality standards (PSD for SO_2). Since the intent of alternatives is to reduce various impacts identified for the Proposed Action, an alternative which violated air quality standards was not deemed appropriate. Thus, in addition to the Proposed Action (Quasar at East Dry Basin) only alternatives which located Quasar at the Buckhorn site were considered. The Buckhorn Alternative locates Quasar and Exxon at their first alternative sites.

Potential significant impacts to big game winter range were predicted for development in the Dry Basin area. Thus, an alternative which located all plant sites outside of the Dry Basin area was desired. The Shute Creek Alternative not only satisfies this objective, but also allows analysis of maximum development in the southern part of the project area.

Finally, an alternative which located all development in the northern portions of the project area (near Big Piney) was deemed necessary to give a wide range of alternatives for analysis. The Northern alternative was identified so that this combination of potential impacts could be assessed.

Other combinations of plant sites were reviewed and eliminated from detailed study because it was felt that they would duplicate situations which would be analyzed as part of the Proposed Action or three primary alternatives.

Multiwell Directional Drilling

As an alternative to development of the well field using vertical wells drilled from single sites, Exxon has proposed to evaluate development of the field using multi-well sites, locating up to four wellheads at a well site and drilling directional holes to reach the producing zone at the appropriate depth and spacing location. In order to fully evaluate the feasibility of directional drilling, Exxon plans to drill several test wells in the near future. The directional drilling program would then be evaluated, and a decision made regarding its use.

Geological constraints have a substantial impact on whether wells can be directionally drilled. The technical feasibility of directional drilling in the Riley Ridge area has not been demonstrated. While it may be practical at certain locations in the well field, too little information is available to apply directional drilling on a project-wide basis. Based on the feasibility of directional drilling and conflicts identified in the senstivity analysis, this alternative will be imposed as mitigation by the Authorized Officer, where necessary.

Project Component or Process Alternatives

In developing the Proposed Action, the applicants reviewed many alternatives for project components and processes. Those which have not been presented as a part of the Proposed Action or an alternative were dropped from detailed considerations. These alternatives and other reasons for eliminating them are summarized below.

1. Treatment Plant Sites

   A site adjacent to the Opal Gasoline Plant was rejected by Northwest prior to filing its application because of topography and the fact that the plants would not be compatible.

2. Sour Gas Treatment

   a. Gas separation alternatives. Exxon evaluated five chemical solvents, two physical solvents, one hybrid solvent, and two physical processes. All were rejected by Exxon prior to filing its application for process reasons.

   b. Tail gas cleanup alternatives. An Amoco CBA sulfur recovery unit was evaluated and rejected by Exxon prior to filing its application because it can only achieve a 98.6 percent recovery of sulfur in the tail gas.

3. Water Supply

   a. Big Sandy Salinity Project (all applicants). Water would not be available in time to supply the developing gas treatment plants. Plant operation would begin in late 1985 to early 1986, while Big Sandy water would not be available until about 1989.

   b. Groundwater for Craven Creek plant (Northwest). Sufficient yield for the plant would be uncertain.

   c. Hams Fork water for Craven Creek plant (Northwest). Sufficient water rights not available.

4. Sulfur Transport

   a. Sulfur pipeline from Craven Creek plant. A pipeline was rejected by Northwest prior to filing its application due to the proximity of the site to an existing railroad.

   b. Long-term truck transport over haul road. Rejected by Exxon prior to filing its application due to inefficiencies.

   c. Sulfur stockpile on plant site. Rejected by Exxon prior to filing its application due to inefficiencies.

IV. MANAGEMENT CONSIDERATIONS

AREAS OF CONTROVERSY

Several concerns about the Riley Ridge Project were raised during the public scoping meetings held in Cheyenne, Kemmerer, Pinedale, and Big Piney, Wyoming on November 2, 3, 4, and 5, 1981, respectively, and through the mail-in comments in July of 1982. The results of these comments were summarized in a document entitled Public Concerns and Scope of the EIS. The draft EIS was filed with the Environmental Protection Agency on May 20, 1983, and announced in the Federal Register on Thursday, May 26, 1983.

During the 60-day public comment period (May 20 to July 19, 1983), BLM and FS conducted four formal public hearings to solicit comments on the draft EIS. The BLM and FS also received 44 letters addressing the draft EIS during the public comment period. The most significant issues raised during the scoping and in the comments concerned socioeconomics, wildlife, air quality, and health and safety.

The socioeconomic effects to communities and the people within the study area from project activities (construction personnel, etc.) was identified as a significant issue and concern. The area has experienced boom-type growth in the past from energy development and is thus sensitive to any similar future developments.

The effects to wildlife and wildlife habitat (especially within the well field) are a major concern to the FS, BLM, Fish and Wildlife Service (FWS), Wyoming Department of Game and Fish, and the general public. Hunting is an important recreational activity in Wyoming. The well field lies in an area which is critical range (wintering areas, calving areas, etc.) for elk, deer, pronghorn (antelope), and moose. Development of all types has reduced the amount of winter range for big game. Feedgrounds have been utilized to compensate for lost habitat; however, the quantity and quality of big game herds has been affected. The well field area encompasses one of the last natural wintering areas in the Upper Green River Valley for elk.

Air quality, concerns were expressed by the BLM, FS, National Park Service, Environmental Protection Agency, and general public. The project area is located in a region of western Wyoming where air quality is good and relatively unaffected by industrial development. The major exception to this is in the trona mining area near Green River, Wyoming. Concerns were generally related to reductions in air quality in national parks and wilderness areas (Class I) and in the general project area (Class II) to reductions in visibility in national parks and wilderness areas, and to the effects of acid deposition on air quality related values in the Bridger Wilderness to the east of the proposed gas treatment plants.

Effects to human health and safety from the release of hydrogen sulfide (H_2S) gas is an issue to the general public and the agencies. The natural gas, as taken from the wells, contains a small percentage of H_2S which is toxic. Potential areas where hazards from H_2S are possible are wells, pipelines, and at the plants. Final locations of sour gas pipelines must consider health and safety factors.

MAJOR IMPACT CONCLUSIONS

Western Wyoming is currently undergoing a change from an area characterized by rangeland and wilderness to one experiencing industrial growth and active exploration and development of oil and gas reserves and other energy and non-energy commodities. This trend is having many beneficial and adverse effects on the human and natural environments of the area. Positive impacts include increased employment and increased local revenue. Revenues directly related to resource extraction associated with the Riley Ridge Project are the state-levied ad valorem and severance taxes and a federally collected royalty. The revenue to Wyoming from the mineral severance tax alone was $138 million in 1981. The result of these revenues has been a substantial increase in the State's general fund and benefits to the entire state and local communities. The responses to Public Hearing comments provide further discussion concerning these revenues.

As with any project, uncertainties exist relative to the timing of project implementation and ultimate size. For the projects included in the Riley Ridge EIS, there is significant potential for delay in project implementation. Although these delays cannot be quantified at this time, it is very probable that several of the proposed plants and the field development in support of those plants could be delayed for a period of up to five years.

The Riley Ridge EIS Proposed Action is a "worst-case" or maximized development and implementation impacts analysis for all projects defined by the applicants in their individual right-of-way applications. If one or more of the proposed plants currently analyzed under the Proposed Action is delayed, the resulting impacts are anticipated to be less than those presented. Since the probable delays cannot be quantified at this time, the reduction of impacts also cannot be quantified.

The major unmitigated environmental impacts of the Riley Ridge Project are detailed in Chapter 4 of the Draft EIS (DEIS). A revised comparative analysis (Section 2) is contained in the final EIS (FEIS). Impacts associated with implementation of the Proposed Action and alternatives considering the committed mitigation measures are compared in this section. However, there are several major issues and impacts associated with the Proposed Action which need to be stressed. These are summarized below.

Socioeconomics

The construction of the Riley Ridge Project would create significant, potentially adverse impacts in the short-term and beneficial impacts in the long-term. The peak direct employment for nearly 3,000 workers would contribute to a strong regional economy in Lincoln, Sublette, and Sweetwater Counties, but place demands on local governments, particularly Sublette County, that would far exceed their current service capacity and fiscal capability. In the long term the revenues accruing to affected jurisdictions could provide substantial local benefits and opportunities for enhancing the quality of life. While these prospects are attractive, the short-term problems could create substantial hardships for newcomers and residents alike, due to crowding and service shortfalls.

Wildlife and Fisheries

Several aspects of the Riley Ridge Project would result in significant adverse impacts to wildlife within the study area. A serious impact would result from the increase in human population and accompanying human disturbance to wildlife in the form of increased hunting and fishing pressure. Increased game violations, harassment, and road kills would also result from the project. Another significant impact would be the disturbance of critical ranges during their season of use and a loss of critical ranges through project development activities.

The project presents the possibility of adversely affecting streams in the well field area. Increased long-term siltation coupled with increased fishing pressure, altered stream flows, and a few accidental spills could create sufficient stress on the existing fishery to significantly reduce its future value. Special concern is held for the native Colorado River cutthroat trout.

Health and Safety

The probability of a well blowout or a pipeline rupture is critical in determining the effects to humans from the presence of H_2S gas. Because the gas is extremely toxic, the frequency of an accident and dispersion of the gas is critical. Analysis for the project has indicated that there would be a potential for 2.3 well blowouts associated with drilling and production operation during the lifetime of this project. Individuals within one-half mile of a well blowout could be subjected to lethal levels of at least 1,000 parts/million H_2S, individuals within 1 to 2 miles could be subject to significant doses of H_2S; i.e., doses that would cause human discomfort.

Based on the pipeline rupture analysis, it was concluded that in any year there is about a 7 percent chance that ruptures would occur in the gathering system, but there is only about a 1 percent chance that a trunk line would rupture. The size of the ruptured pipeline would determine the potential impact on humans. The rupture of a 4-inch pipeline would not result in lethal H_2S doses to people in towns or traveling established routes, while the rupture of a 12-inch pipeline or an 18 to 26-inch pipeline could cause lethal doses to individuals within 1 to 3 miles, respectively.

Based on modeling results with the implementation of mitigation measures, populated areas (such as Big Piney and LaBarge) and sensitive receptors (such as isolated ranches and industrial sites) in the study area would be at minimum (less than 3 in 100,000) risk of exposure to significant levels of H_2S from a trunk line rupture.

Water Resources

Impacts to water resources are difficult to assess because of data gaps relating to (1)characteristics of the surface and groundwater systems, (2)the frequency of events (leaks, ruptures, other failures) affecting water resources, and (3)engineering details on the applicant's waste water disposal systems. While quantification is not possible, significant impacts on water resources are expected to occur during the life of the project. In order to reduce potential impacts, mitigation measures have been developed but additional environmental analysis and monitoring will be required. The project will also have to comply with the permit requirements of the State of Wyoming.

Air Quality

While significant air quality impacts were predicted from the operation of the Riley Ridge Project, all companies would be required to comply with the Prevention of Significant Deterioration (PSD) Class II increment for sulfur dioxide (SO_2) and the Wyoming Ambient Air Quality Standard (WAAQS) for hydrogen sulfide (H_2S). There would be no exceedances of the PSD Class I standards. Significant odor impacts resulting from releases of small amounts of H_2S would occur near the East Dry Basin plant site but would not affect populated areas.

Soils and Vegetation

The Riley Ridge Project would disturb approximately 12,115 acres of soils and vegetation during construction and 3,620 acres during operation. 641 acres, or 5 percent, would remain in roads and railroads after abandonment. In assessing significant impacts, it has been assumed that the Erosion Control, Revegetation, and Restoration Guidelines (Attachment B.7) would be successfully implemented and that soils would be stabilized within 5 years following construction or abandonment. No signficant impacts to soils are anticipated. About 63 acres of riparian vegetation would be disturbed by well field access roads and the sulfur loadout during project operation, and this long-term disturbance is considered a significant impact.

Visual Resources

The project as proposed would substantially alter the visual character of much of the project area. It would contribute to a continued progression from a predominantly natural landscape to one that is man-dominated. Most affected would be the well field and lands crossed by the molten sulfur pipeline.

Cultural Resources

Construction and operation of the Riley Ridge Project would cause both direct and indirect impacts to cultural resources in the study area. A Class III (100 percent) survey of each area to be disturbed will be conducted prior to construction to determine the actual resources present and the potential impacts to those resources. Less than 5 percent of the study area has been previously surveyed.

Recreation

During the years when the construction workforce would be at its peak, the quality of recreation experiences available in the area would be significantly impacted. The long-term prospects, however, would be much more favorable and all affected groups, newcomers, long-time residents, and temporary visitors, would be able to enjoy the area's many recreation opportunities.

Wilderness

Both short-term and long-term significant impacts to wilderness-related values would occur to the following areas: Bridger Wilderness, Scab Creek Instant Study Area, Lake Mountain Wilderness Study Area, and high density use corridors of the Popo Agie Primitive Area and Teton Wilderness. Impacts would be primarily attributed to anticipated increases in visitation. The ability of the wilderness resources to absorb social, physical, and biological impacts would likely be exceeded. Wilderness related values could be significantly impaired by severely diminishing the quality of user experiences through increased visitation. Potential impacts of one air quality related value (AQRV), water quality related to acid deposition in high mountain lakes, has been determined to be significant.

Agriculture/Grazing

Impacts to agriculture and grazing would be generally insignificant. Significant impacts due to loss of forage, however, would occur in 5 small grazing allotments during construction. Unquantifiable but significant impacts could also occur to those ranchers using the Slate Creek sheep trail. There would be no impacts to prime farm land.

Timber

Impacts to timber would be generally favorable due to project construction of new access roads that would reduce the costs of timber harvesting in otherwise remote and previously inaccessible areas.

Transportation

In the summers of peak development, construction activities plus anticipated recreational travel would create traffic volumes that would lead to traffic congestion and traffic slowing in and around Kemmerer, Opal, LaBarge, Big Piney, and Marbleton during peak commuter hours. While these would not be so severe as to disrupt emergency services (police, fire, and ambulance) they could be annoying to the resident public and perceived as a degradation in the quality of life in the area. These impacts would only be temporary, however. Once construction is completed, traffic volumes due to the proposed project would decrease substantially.

Land Use

The principal land use conflicts of the proposed project are with the planning objectives of the federal land management agencies to locate linear facilities such as transmission lines and pipelines in common corridors. Except for conflicts with Sublette County zoning, which would probably be dealt with administratively for many areas affected by the project, existing land use plans encourage the type of development that is proposed.

Noise

Noise impacts would be localized but significant during construction due to heavy truck traffic. Residences and businesses within one-half mile of U.S. 189, U.S. 30, and S.R. 240 would be most affected.

DECISION RATIONALE

Having congnizance of the above concerns the following management considerations were key in the decision to authorize the selected Riley Ridge Natural Gas Project right-of-way permits and leases.

Well Field

Leaseholders must be given their legal right to develop their various leases. Thus, the Federal Government (BLM and FS) is obliged to approve or disapprove APD actions for the active federal gas leases.

The Secretary of the Interior does not have the power to totally deny APDs strictly on environmental grounds. Site-specific APDs, however, can be denied on environmental grounds, but drilling must be allowed at some reasonable location on the lease, with reasonable mitigation measures.

To insure that the purpose and intent of NEPA is met and complied with in well field development, the BLM and FS, in conjunction with the preparation of the EIS, also developed a "Well Field Sensitivity Analysis System" technical report. The objective of the sensitivity analysis system is to: (1) identify sensitive and critical resources in the field; (2) identify potential conflicts; (3) develop solutions and mitigation measures to aid agencies in processing APDs; and (4) to provide a system that can be used for the management and monitoring of the well field throughout its life.

The BLM and FS are committed to ensuring that APD authorizations are based upon and supported by the Riley Ridge Natural Gas Project EIS, the Well Field Sensitivity Analysis System and that they comply with all standard procedures and requirements to mitigate potential impacts. In furtherance of this commitment, the BLM and FS have developed the APD Environmental Reference Report and Decision Record procedure described in Attachment D.

Treatment Plants

1. Management considerations paramount in the selection of the treatment plant locations were as follows:

   a. Socioeconomics

   Because Lincoln County is stronger in terms of fiscal condition than Sublette County, it would be better prepared to deal with the growth that would be associated with project development.

   The alternative was approved because of the overwhelming support by county (Lincoln, Sweetwater, and Sublette) and local (Kemmerer, Diamondville, LaBarge, Big Piney, Pinedale, and Rock Springs) governments, and the general public. They support this alternative because it would locate the treatment plants between Lincoln and Sublette Counties to provide the most balanced distribution of growth.

   b. Wildlife and Fisheries

   Increased human population and its related impacts, (e.g. legal and illegal hunting and fishing, wildlife harassment, road kills, and unintentional disturbance, etc.), would be less with the modified Shute Creek Alternative. This alternative allows a more even distribution of increased population within the study area. It would however, result in increased impacts to deer and antelope critical winter range at East Dry Basin. This tradeoff is preferred when compared to having a sour gas pipeline, sulfur pipeline, and power transmission line crossing the Green River. This would significantly affect fisheries in the event of a rupture, and waterfowl, eagles, whooping crane, etc., through collision with the powerline.

Because the East Dry Basin Plant location would permanently (30-50 years) eliminate 640 acres of critical deer and antelope winter range, Quasar would be required to investigate and evaluate the potential for mitigating the loss of critical winter range. This will be conducted in cooperation with the Wyoming Game and Fish and the BLM. All reasonable methods of mitigation shall be summarized in a mitigation plan, which will include a description of the methods, implementation, and monitoring, and shall be included as part of Quasar's Construction and Use (CU) Plan for the treatment plant for approval by the Authorized Officer.

c. Air Quality

Combined SO_2 impacts would be the least for this alternative. Odor impacts would be next to the lowest. Some residences may experience odor-causing levels (6.5 to 10 parts/million) of H_2S within a 4-mile radius of the East Dry Basin plant. The Buckhorn plant site is the only alternative site to offer less impact from odor. However, if a market for CO_2 is found, no odor problem should exist (90 percent of the odor problem is due to the venting of CO_2 which contains approximately 10 parts/million H_2S).

d. Recreation

Through the more even distribution of human population growth, recreation use patterns would create less impact.

e. Health and Safety

Since potential release of H_2S is proportional to the length of the sour gas trunk lines, this alternative would pose the highest potential impact. However, by applying the mitigation specified in Mitigation Measure H-4 the risk of H_2S exposure is comparable to those of the other alternatives.

f. Soils

Due to the highly critical watershed problem that exists in the area between the Green River and the Buckhorn plant site, the East Dry Basin plant site is preferred. Construction of a sour gas trunk line, sulfur pipeline, power transmission line, and access road to the Buckhorn site would cause increased erosion and sedimentation into the Green River, as well as intensify the problem of plugging the existing irrigation canal and spreading alluvial material over hay and pasture land. These disturbances would be avoided by locating the treatment plant at East Dry Basin.

2. East Dry Basin approval would be subject to satisfying the following concerns prior to granting:

a. Since American Quasar has announced that there will be an indefinite delay in their project plans, cumulative impacts associated with the Riley Ridge Project and other project developments must be reevaluated prior to granting. This is required to determine if the federal actions requested by Quasar are still within the parameters considered in the EIS.

b. In three to five years the transportation situation may completely change. Plant sites, sulfur loadout terminals, etc., not feasible today may be entirely so in a few years.

c. Because of the environmental concerns associated with the East Dry Basin, West Dry Basin and Buckhorn area in general, a need to reevaluate each location to determine if the East Dry Basin site is the most suitable has been recommended. The identified environmental concerns are as follows:

- East Dry Basin provides critical deer and antelope winter range.
- A plant at East Dry Basin would cause some residences to experience odor-causing levels (6.5 to 10 parts/million) of H_2S within a 4-mile radius of the plant.
- A plant at Buckhorn would require crossing the Green River with a sour gas pipeline, molton sulfur pipeline and power transmission line potentially affecting fisheries, waterfowl, eagles, whooping crane, etc.
- Buckhorn site access would cause the disturbance of highly erodible soils between the Green River and the plant site which would accelerate the siltation of irrigation ditches, adjacent hay fields and the Green River.
- West Dry Basin is not classified as critical winter range.
- The West Dry Basin site is 7-miles west of East Dry Basin site and thus should not subject residences to odor causing levels of H_2S.
- Placing the proposed Quasar plant (1.2 billion cfd production capacity) at West Dry Basin would violate air quality standards. A reduction in plant production capacity could meet air quality standards.

Trunk Lines

Sour gas trunk line siting is largely a function of the well field gathering system terminus and the treatment plant locations. With these two points determined trunk line routing and alignment is concerned with (1) health and safety and (2) selecting an alignment that will cause the least environmental impact.

1. Health and Safety

Health and safety considerations are related primarily to public and worker exposure to hydrogen sulfide gas (H_2S) in excess of acceptable levels.

Health and safety impacts from H_2S releases would be considered significant if exposure is likely to impair the sense of smell, irritate the eyes, or affect respiration. Exposure to 100 parts/million H_2S for 15 minutes is likely to cause these levels of discomfort, but is generally recognized to be a sublethal dose. Exposure to 250-500 parts/million H_2S for two minutes or less may also cause similar degrees of olfactory, visual, or respiratory distress, and may also be lethal to unusually sensitive individuals.

Of greater concern, one which goes well beyond the question of Health and Safety 'significance' is the possibility of lethal doses. Exposure to 1,000 parts/million of H_2S, even for an instant, is generally taken to be a lethal dosage unless immediate measures are taken to revive the victim.

Therefore, persons located beyond the extent of the 500 parts/million, instantaneous concentration or the 100 parts/million, 15-minute average concentration (whichever is farther) are considered to be outside the region of significant impacts. Nothwithstanding numerous safety measures for the pipeline system, it is nevertheless possible that a pipeline rupture may occur. Historical data on sour gas lines in Alberta, Canada, and on sweet gas lines in the United States support a rupture probability estimate of 0.0002 ruptures per pipeline mile-year (or one rupture per 5,000 mile-years). Historical data also suggest that ruptures occur more frequently in smaller pipes and in older pipes.

These probabilities show that there is a greater likelihood of a rupture in the gathering system than in the trunk lines, because there are more miles of pipeline in the gathering system. In any year there is about a 7 percent chance that one or more ruptures would occur in the gathering system, but there is only about a 1 percent chance that a trunk line would rupture. However, the possibility of a trunk line rupture is the more important concern, for the following reasons.

There are numerous differences between gathering pipeline systems and trunk lines. Gathering pipeline systems would generally be located in sparsely populated areas whereas trunk lines would pass closer to local communities. Gathering systems would generally be constructed of smaller diameter pipes, and the block valve spacing for gathering lines is usually less than for trunk lines. Therefore, if a rupture were to occur,the mass of gas released would be less from a gathering pipeline than from a trunk line.

Health and safety impacts would be mitigated by revised mitigation measure H-4. This measure requires that no sour gas trunk line be located closer than 1 mile to populated areas or sensitive receptors. The measure will reduce the probability of significant H_2S exposure to less than 3 in 100,000. It will require the location of the trunk lines away from sensitive areas.

Due to the distance restriction on sour gas pipeline location to receptors, alignment of two 24 to 30 inch pipelines across LaBarge Creek in the vicinity of the applicants' proposal will not be possible without (1) consumating a receptor (residence) purchase agreement for the two residences in the NE 1/4 NE 1/4, section 22, T. 26 N., R. 113 W.; and obtaining a variance for the receptor in NW 1/4 SE 1/4, section 14, T. 26 N., R. 113 W., and the receptor in NE 1/4 NE 1/4, section 26, T. 26 N., R. 113 W.; or (2) consumating a purchase agreement for the receptor in the SW 1/4 SW 1/4, section 22, T. 26 N., R. 113 W., and variances for the receptors in each the NE 1/4 NE 1/4, section 22, and the NW 1/4 SE 1/4, section 28, T. 26 N., R. 113 W.

If neither of the above two options can be satisfied, there is only one pipeline routing option left, which is along the east toe of the Hogsback crossing LaBarge Creek at the narrows in sections 19 and 30, of T. 26 N., R. 113 W. One variance would have to be obtained in accordance with Health and Safety Measure H-4, for the receptor in NW 1/4 SW 1/4, section 21, T. 26 N., R. 113 W.

2. Sour Gas Pipeline Alignment

Selecting an alignment that will cause the least environmental impact includes application of the required federal and applicant mitigation measures, the erosion control, revegetation and restoration guidelines, and the committed federal measures, developed through the EIS process (see Attachment B).

Pipeline location will, wherever feasible and reasonable, (1) utilize existing corridors; (2) minimize visual intrusion; (3) avoid historic trails; and (4) apply required measures to minimize increased sedimentation at all stream crossings.

Sales Gas Pipelines

Rationale is as presented in Section II, Sales Gas Pipelines.

Carbon Dioxide (CO_2) Gas Pipelines

Rationale is as presented in Section II, CO_2 Gas Pipelines.

Sulfur Transport and Loadout Facility

The Agency decision for transporting sulfur produced at the East Dry Basin plant is by molten sulfur pipeline. The reason for selecting this method over a railroad spur was essentially due to length. The sulfur pipeline would be approximately 54 miles long while the railroad spur would be approximately 92 miles long. Because of the additional length, the rail spur would disturb additional riparian vegetation and sensitive rehabilitation units. Because of its two crossings of the Green River the rail spur would cause increased temporary sedimentation of the river and stream crossings. The acreage permanently removed from production by the rail spur is 279 acres, or a 174 acre increase over the sulfur pipeline.

The molten sulfur pipeline would cause an increase in the miles of significant and highly significant visual impact, specifically 11.5 and 14.25 respectively versus 2 and 4 respectively for the rail spur. In addition, because the proposed location would parallel the Sublette Cutoff Emigrant Trail, public concern was raised and a relocation recommended. Also, because the location of 4 of the 5 sulfur drains are situated in major drainage bottoms (Sheep Creek, Fontenelle Creek, Muddy Creek, and LaBarge Creek) the need for further site specific analysis was indicated.

It is for the above reasons, coupled with the fact that no other alternative sulfur pipeline routings were analyzed, and questionable current technology for constructing a "workable" 54 mile long molten sulfur pipeline, that the Agency Decision is to withhold action until additional analysis is completed. Final action on the sulfur loadout facility would be handled at the same time.

Power Transmission Lines

The Agency Decision is to approve the applicant's proposed power transmission route over the UP&L and BLM routes. The reason for this is that the UP&L and BLM system would disturb significantly more acres of sensitive rehabilitation units than the Applicant's system. The UP&L system would also disturb up to 58 percent more cultural sites than the Applicant's system.

Treatment Plant Water Requirements

No significant impacts were identified with the water pipeline from the Green River to Northwest's treatment plant. Water purchase will be from the State of Wyoming and the intake structure will have to comply with State standards.

Employee Housing

The DEIS Agency Preferred Alternative specified that all applicants would be required to provide contruction camps for housing at all plant site locations. The basis for this is that:

1. Construction camps for employees and contractor housing would reduce impacts on housing.

2. Construction camps would reduce the amount of traffic on area roadways and thus the incidence of traffic accidents.

3. Construction camps would reduce the housing glut when construction terminates.

In consideration of public comments received encouraging the placement of construction camps within close proximity to towns, the Agency Decision is to require the applicants to provide costruction camps. However, the placement of them (at the plant site or close proximity to towns) will be at the applicants discretion.

Gravel, Riprap, and Fill Materials

An estimated total of 1,735,110 cubic yards of gravel and riprap will be required for well field development, plant construction and road construction. This material would be obtained from the ROW, commercial sources, or lands adjacent or near the ROW. Sources on public lands may be subject to further environmental anaysis at the time they are identified.

V. MITIGATION

The mitigation measures included in this record of decision (ROD) are specific requirements with which the applicants will have to comply. These requirements will be included, as appropriate, in the applicants' right-of-way grants, approved APDs, and other permits. The BLM and FS have committed to these measures and are responsible for their enforcement. In the event of a delay in project implementation, mitigation measures will be reviewed by the agencies at the time of grant development to ensure their applicability and to ensure that all appropriate and necessary mitigation measures are applied as stipulations. This will prevent impacts from exceeding the worst-case analyzed and mitigated in the EIS. Implementation of stipulations will be in a timely manner based on the applicants schedule of development activities.

One additional mitigation measure (WF-15) and one modified mitigation measure (WF-6) has been added to those presented in the DEIS and FEIS. The mitigation measures are found in Attachment B and are divided as follows.

ATTACHMENT B

Required Federal Measures and Applicants' Standard Operating Procedures Designed to Reduce Environmental Impacts.

B.1 Applicants' Standard Operating Procedures
B.2 Federal Regulations: Terms and Conditions
B.3 Current Lease Stipulations on Occupancy
B.4 Well Field Oil and Gas Operating Measures
B.5 General Measures
B.6 Roading Guidelines for Gas Exploration and Development Within the Riley Ridge Project Area.
B.7 Erosion Control, Revegetation, and Restoration Guidelines
B.8 Required Federal Mitigation Measures
B.9 Sour Gas Trunk Line Mitigation Measures

VI. MONITORING

IMPLEMENTATION TASK FORCE

The BLM and FS, in light of the magnitude and complexity of the Riley Ridge Project, entered into a Memorandum of Understanding (MOU) in September 1983, for the purpose of overseeing implementation of the Riley Ridge Project. This includes review and quality control of required applicant plans for associated construction, operation, maintenance, and termination of proposed facilities and well field development. As part of the MOU a Task Force made up of BLM, FS, and Wyoming Game and Fish representatives would be established. A copy of the MOU is found as Attachment A.

Although not specifically stated in the MOU, but implied in its purpose, one paramount function of the Task Force would be to ensure that monitoring committed to is carried out. Included in this responsibility is ensuring the development of a BLM comprehensive monitoring plan which will address the scheduling, implementation, agent, applicant responsibility and costs, reporting procedure, etc. for each of the monitoring programs found in Appendix E of the FEIS. In addition, the CU Plan required by each applicant for off-lease use authorizations, approval of which is required prior to granting or issuing a right-of-way (FLPMA, 1976, Sec. 504 (d)), must include a detailed description of all the maintenance and monitoring that will be performed.

IDENTIFIED MONITORING

Groundwater Monitoring - Appendix E-1 (FEIS)

The collection of hydrogeologic information and the design of a groundwater monitoring program have yet to be accomplished. This should be conducted in conjunction with involved state and federal agencies including the U.S. Geological Survey, Bureau of Land Management, U.S. Forest Service, Wyoming State Engineer, Wyoming Oil and Gas Conservation Commission, and the Wyoming Department of Environmental Quality.
The Wyoming Department of Environmental Quality has identified requirements for project implementation which are dependent upon the resolution of certain issues related to water resources. These include the following:

1. Potential impacts to water quality must be adequately addressed and information submitted to the Water Quality Division during the permitting process.

2. Any part of the project requiring a Water Quality permit must provide data adequate to allow an evaluation of potential impacts to groundwaters of the state, prior to construction being authorized. Background (baseline) groundwater quality must be submitted to the Water Quality Division, adequate to characterize the groundwater wherever it might be impacted.

3. The applicant should be making the necessary studies and collecting data to fill the data gaps. Detailed information on geology and hydrology is needed.

4. In addition to considerations on pages B-2 and B-3,of Attachment B, the following may also be required.

- a Potentiometric surface maps;
- b Periodic analyses and reporting of waste (injected) water quality, and water quality of certain specified monitor wells;
- c Periodic reporting of daily and maximum injection volumes an pressures as required by any injection well permit issued by the Water Quality Division;
- d Monitoring of annulus pressure of any injection well permitted by the Water Quality Division;
- e Mechanical integrity testing of all waste injection wells permitted by the Water Quality Division.
- f Other Water Quality Division requirements, depending on the contents of the application submitted.

5. Water Quality Division requires waste disposal wells to be constructed with tubing and packer, and the casing-tubing-packer construction tested (mechanical integrity test) prior to first use and at least once every five years thereafter. Casing is to be cemented from the surface to the injection zone; a cement bond log is recommended as an acceptable method to demostrate absence of channels for fluid movement vertically outside the casing.

6. Water Quality Division often requires ponds to be lined, to protect groundwater.

7. Applicant should ascertain which Water Quality Division permits are required for mancamps, and obtain same before construction of camps begins.

Air Quality Related Values Action Plan - Appendix E-2 (FEIS)

The Wilderness Act (1964) and the Clean Air Act as amended in 1977 gives the Forest Service responsibility to protect the wilderness resource on National Forest System lands from man-caused degradation. However, in response to air pollution, action under the Wilderness Act could probably be taken only after an impact on the wilderness has occurred and consequences may be difficult to reverse once detected.

The action plan has been developed to: (1) identify sensitive receptors, if any, for each air quality related value; (2) determine baseline physical, chemical and/or biological conditions of each identified sensitive receptor; and (3) establish a program to monitor any impact on sensitive receptors caused by changes in air quality.

The action plan has been designed to look at not only those impacts from the Riley Ridge projects but at those impacts resulting from future oil and gas developments.

Fisheries and Surface Water Quality Monitoring Program - Appendix E-3 (FEIS)

1. Fisheries

    The fisheries monitoring program will be implemented to observe changes in fish habitat (including water quality) or fish populations that would be detrimental to the fishery. Should a change be observed that is linked to the applicant's development, the applicant will take corrective measures to eliminate the cause. The monitorng program will be set up in three major areas: (1) a site-specific monitoring station; (2) three or four long-term monitoring stations to observe cumulative well field development effects, and (3) annual reconnaissance of all applicant-constructed facilities to observe changes that could harm the fishery. The determination of the type of monitoring program will be made at the time a specific development site is located.

2. Surface Water

    The surface water monitoring program is primarily intended to detect changes in water quality which may affect aquatic life. Additionally, the program will detect changes from baseline conditions which may indicate the need for more extensive monitoring. Sampling will be supervised by the BLM or FS. Stream sampling locations will include the four established stations in the well field on Fish Creek, Beaver Creek, Pine Grove Creek, and Black Canyon Creek as well as others that may be specified by the Authorized Officer. These stations will coincide with locations for aquatic monitoring stations (Stations f-1, B-1, PG-1, BC-1, see Wildlife and Fisheries Technical Report).

Cultural Resources Compliance Guidelines - Appendix E-4 (FEIS)

It is BLM and FS policy to protect cultural resources by avoiding or mitigating any adverse effects that may occur to cultural resources from a Bureau-authorized action. The Environmental Impact Statement for the Riley Ridge Project stated that adverse impacts would occur to cultural resources. Therefore BLM, Wyoming State Office Manual 8143 Procedures for Avoidance and/or Mitigation of Effects on Cultural Resources and appropriate Forest service procedures will be followed for the Riley Ridge Project. The Cultural Resources Compliance Guidelines provide a brief overview of work that has been completed and a guide to future work needed for compliance with historic preservation legislation and BLM policy.

Roads - Attachment B.6 (ROD)

1. Quality Control - Road Construction

The operator has the responsibility to ensure that each road is constructed according to plans and specifications approved by the FS or BLM. Forest Service Standard Specifications for the Construction of Roads and Bridges shall be utilized to establish and maintain construction standards. Copies are available from the Forest Supervisor's Office. The degree of construction control should complement the survey and design methods utilized. Lower standard surveys and designs may require more intensive construction engineering to assure an acceptable end product.

The FS or BLM will make periodic inspections to ensure that each road is properly constructed, at which time control tests and charts maintained by the operator shall be made available for review. This shall include density tests, aggregate gradations, photographs showing construction techniques, daily diaries, etc.

2. Quality Control - Road Maintenance

The applicant's CU Plan shall include a maintenance plan for all roads constructed or used by the applicant on or off lease.

Users of forest development roads shall pay their fair share of maintenance costs, and use of forest roads will be approved by FS road permits. This includes roads which lead to the area where additional access is needed. Lessees may either perform actual maintenance activities or pay cooperative deposits as the FS approves. Before a bond release is signed, all road damage caused by the user shall be repaired in a manner approved by the FS (this will not apply to BLM lands).

The maintenance plan should have definite provisions for preventing undercutting of cut banks and the unnecessary removal of established stabilizing vegetation on fill side of road (operators should be given special instructions).

Erosion Control, Revegetation and Restoration - Attachment B.7 (ROD)

Maintenance and Monitoring

Joint inspection of the right-of-way by the applicant and authorizing agency will be conducted to monitor the success and maintenance of erosion control measures and revegetation programs on disturbed land for two growing seasons, or for a period determined by the landowner on private land, or the authorized agency official on state or federal land. The monitoring program will identify problem areas and corrective measures to ensure vegetation cover and erosion control. Successful revegetation and erosion control will be determined and certified by the landowner or authorized agency official.

VII. CONSULTATION AND COORDINATION

The BLM and the FS requested and received consultation from many organizations and individuals, public and private, in developing the draft and final Environmental Impact Statement for the proposed Riley Ridge Natural Gas Project.

SCOPING PROCESS

Regulations for implementing the National Environmental Policy Act (40 CFR, Part 1501.7) require an early and open scoping process. During this process, the scope of issues to be analyzed and significant issues related to the Proposed Action were identified. Information obtained during the scoping process was one of the sources used to determine significant impacts to be addressed in detail in the EIS.

Additional purposes of the scoping process were to inform affected federal, state, and local agencies and other interested persons about the proposal, and to identify existing environmental reports and information related to the proposal. Through the scoping process, decision making is enhanced by emphasizing significant issues and reducing the magnitude of paperwork and the length of the statement.

The details of the public scoping meetings held during the initial phases of the environmental impact statement work are summarized in Appendix A of the draft EIS.

DRAFT EIS CONSULTATION AND COORDINATION

The BLM and FS were joint lead agencies responsible for preparation of the EIS for the Riley Ridge Natural Gas Project. Cooperating agencies included the Fish and Wildlife Service, Federal Energy Regulatory Commission, Corps of Engineers, and the Environmental Protection Agency. All of the above mentioned agencies provided written comments on early drafts of the EIS and the technical reports prior to publication of the draft EIS and Technical Reports in May 1983.

Table 4-1 on page 4-1 of the FEIS lists the federal and state agencies, local governments, and individuals that were sent copies of the draft EIS and requested to complete a formal review ofthe document.

PUBLIC REVIEW OF THE DRAFT EIS

The draft EIS (INT. DEIS-83-34) was filed with the Environmental Protection Agency on May 20, 1983, and announced in the Federal Register on Thursday, May 6, 1983 (Vol. 48, No. 103, Page 23,719). In addition, media releases were sent to area radio stations and newspapers to announce the availability of the draft EIS and locations of public hearings, described the Proposed Action, identified key impacts, and requested public comment on the adequacy of the statement.

Approximately 850 copies of the draft EIS were distributed by mail to various individuals, organizations, and government agencies.

During the 60-day public comment period (May 20 to July 19, 1983), BLM and FS conducted four formal public hearings to solicit comments on the draft EIS (see Table 4-2 of the FEIS for further details). The public hearing transcripts have not been reprinted in the EIS as they are part of the public record. Copies of the hearings are available for review at the following offices:

Bureau of Land Management
U.S. Department of the Interior
Bureau of Land Management
Wyoming State Office
2515 Warren Avenue
P.O. Box 1828
Cheyenne, WY 82001

District Manager
Bureau of Land Management
Rock Springs District Office
P.O. Box 1869
Highway 191 North
Rock Springs, WY 82902-1869

Area Manager
Bureau of Land Management
Pinedale Resource Area
P.O. Box 768
431 East Pine Street
Pinedale, WY 82941

Area Manager
Bureau of Land Management
Kemmerer Resource Area
P.O. Box 632
415 U.S. 30 North
Kemmerer, WY 83101

Forest Service
U.S. Department of Agriculture
Forest Supervisor
Bridger-Teton National Forest
P.O. Box 1888
340 N. Cache Street
Jackson, WY 83001

District Ranger
Big Piney Ranger District
P.O. Box 218
591 Front Street
Big Piney, WY 83113

The BLM also received 44 letters addressing the draft EIS during the public comment period. All letters and testimony were assigned a reference number and reviewed. Substantive comments (those that presented new data, questions or new issues bearing directly on the effects of the Proposed Action and its alternatives) were responded to.

PUBLIC REVIEW COMMENTS ON THE FINAL EIS

The final EIS was filed with the Environmental Protection Agency on November 28, 1983. Although not an official comment period, commments received on the final EIS were considered in developing this Record of Decision. The BLM and·FS received 8 letters on the final EIS, 1 late letter on the draft EIS, and 1 letter which had been inadvertently misfiled on the draft EIS. Each was carefully reviewed and considered in the development of this Record of Decision. For the benefit of the reviewer and user of this document, the 10 letters received are found in Attachment E.

ATTACHMENTS

A. Memorandum of Understanding Between The Bureau Of Land Management (BLM) And The Forest Service (FS) For Management Of The Riley Ridge Project.

B. Required Federal Measures And Applicants' Standard Operating Procedures Designed To Reduce Environmental Impacts.

C. Supplemental Environmental Assessment To The Riley Ridge Natural Gas Project FEIS - Sour Gas Pipeline Alternatives.

D. Application For Permit To Drill (APD) Environmental Reference Report And Decision Record.

E. Public Comments Received On The Riley Ridge Final EIS.

F. Maps

Map S-1 Riley Ridge Natural Gas Project Record of Decision (North 1/2).

Map S-2 Riley Ridge Natural Gas Project Record of Decision (South 1/2).

Map 1 - Sour Gas Trunk Line-Proposed and Alternative Alignments

ATTACHMENT A

Memorandum of Understanding
between
The Bureau Of Land Management (BLM) And The Forest Service (FS) For Management Of The Riley Ridge Project.

ATTACHMENT A

MEMORANDUM OF UNDERSTANDING
BETWEEN THE
BUREAU OF LAND MANAGEMENT (BLM) AND THE FOREST SERVICE (FS)
FOR MANAGEMENT OF THE RILEY RIDGE PROJECT

I. INTRODUCTION

The Bureau of Land Management (BLM) of the U.S. Department of Interior and the Forest Service (FS) of the U.S. Department of Agriculture have jointly prepared an environmental impact statement (EIS) on the Riley Ridge Project. The Riley Ridge Project would involve construction of proposed processing plants for sour gas treatment, gas field development, and associated ancillary facilities upon lands administered by the BLM and FS.

The BLM and FS are responsible for approving and issuing right-of-way grants, special land use permits, and other necessary permits for facilities utilizing or crossing lands administered by these agencies. In addition, the BLM is responsible for approving the gas wells and associated field development (due to merger of MMS with BLM by Secretarial Order No. 3087, dated December 3, 1982). The FS is responsible for making recommendations to the BLM on gas field development for those activities on FS lands.

II. PURPOSE

The purpose of this MOU is to establish agreement and procedure between the BLM and the FS for overseeing implementation of the Riley Ridge Project Record of Decision (ROD) including review and quality control of required applicant plans for associated construction, operation, maintenance, and termination of proposed facilities and well-field development.

III. RESPONSIBILITIES

WHEREAS, the State Director of the Wyoming BLM has the authority and responsibility to administer the surface resources of land reserved from the public domain under the jurisdiction of the BLM in Wyoming and has the authority and responsibility to administer leases for Federal minerals under the Mineral Leasing Act of 1920, as amended, within the jurisdictional areas of both the BLM and FS, and

WHEREAS, the Regional Forester of the Intermountain Region of the FS has the authority and responsibility to administer the surface resources of lands reserved from the public domain and acquired public lands of the National Forest System under the jurisdictional of the FS:

THE BLM AND FS AGREE TO THE FOLLOWING:

a. Each will identify and provide a representative or representatives to serve on a Implementation Task Force overseeing project development. This Task Force will represent on-the-ground managers from each of the agencies (BLM Area Managers and FS District Ranger(s)). In addition the Task Force will include a representative from the BLM Rock Springs District Division of Mineral Resources and Division of Planning and Environmental Assistance, and a BLM or FS construction engineer. The Task Force will also include a member from the Wyoming Game and Fish Department (GF). The responsibilities of this Task Force are described below.

TASK FORCE RESPONSIBILITIES

1. Will ensure that the information contained in the Sensitivity Analysis is maintained and updated throughout the life of the Riley Ridge Project. BLM will computerize the Sensitivity Analysis and maintain it. FS will be provided access to the computerized sensitivity analysis system as requested. Funding of the system will be shared. Each agency's portion will be as mutually determined and documented in an annual work plan approved by both agencies.

2. Will jointly review all Applications for Permits to Drill (APDs) submitted for the Riley Ridge Well Field area (as defined in the EIS). Will ensure that the mitigation program contained in the ROD is incorporated into APDs submitted for this area. All reviews will occur during the required 30 day turn-around time period. (Flexibility will be maintained in required reviews. As a minimum the affected land manager(s), and BLM Divisions of Mineral Resources and of Planning and Environmental Assistance Task Force members would review submitted APDs).

3. Will utilize the Sensitivity Analysis (prepared during the Riley Ridge EIS process) during review of APDs.

4. Will ensure site-specific stipulations are atttached to each APD, based upon measures determined through the EIS, ROD and the Sensitivity Analysis, and will attach any additional measures deemed appropriate as approved by appropriate management.

5. Will ensure coordination with and input from agency resource specialists, and agency construction engineer depending upon sensitivity of specific resources (as determined through the Sensitivity Analysis and the EIS).

6. Will obtain appropriate management approval of each APD action.

7. Will provide assistance to appropriate management in working with each of the Riley Ridge applicants in reviewing and revising construction and use plans for each right-of-way, temporary use permit, or other BLM or FS permit.

8. Will ensure that site-specific stipulations are attached to rights-of-way, temporary use permit, or other BLM or FS measures proposed in the EIS, ROD and Sensitivity Analysis. Will also ensure that site-specific EAs are prepared as needed. The Task Force will review these EAs to ensure conformance with the EIS ROD and Sensitivity Analysis.

9. Will ensure that appropriate management approval of each of these permits is obtained.

10. Will coordinate with and obtain input from local citizens and local special interest groups, as needed, on actions performed as a Task Force.

11. Will conduct a formal annual field evaluation and compliance review of project implementation. A status report will be prepared summarizing progress, conformance with the mitigation program incorporated into APDs and construction and use plans, identification of problems, and recommendations for problem resolution. This report will be submitted to the BLM, Wyoming State Director and Rock Springs District Manager, and the FS, Intermountain Regional Forester and Bridger-Teton National Forest Supervisor, through the Riley Ridge Management Committee. Additional evaluations and reviews will be conducted if major changes in condition warrent.

B. The BLM will, because of its authority and responsibility to adminster leases for Federal minerals within the jurisdictional areas of both the BLM and FS, and because the planned sweetening plants and ancillary facilities are located on BLM amdinistered lands, designate a Riley Ridge Project Coordinator within the Rock Springs District. The responsibilities of the Project Coordinator are described below.

PROJECT COORDINATOR RESPONSIBILITIES

1. Will be one of the BLM designees to the implementation Task Force overseeing project development.

2. Will ensure project implementation continuity, and insure that all the Task Force responsibilities are in fact carried out.

3. Will ensure that all Task Force members are kept informed of any changes, new developments, etc.

4. Will ensure that the District Manager, Forest Supervisor, and Riley Ridge Management Committee are kept apprised of Task Force activities and project implementation progress and status.

5. Will ensure appropriate Task Force member review of APDs within the time period allowed. Will consolidate Task Force APD review input and submit it to appropriate management for final APD processing.

6. Will ensure the actual maintenance and update of the information contained in the Sensitivity Analysis for both the manual overlay and computerized systems. All updates will be coordinated with the Task Force.

7. Will ensure/conduct the actual coördination with and input from BLM and/or FS resource specialists as deemed appropriate by the Task Force.

8. Will receive and consolidate all Task Force input and review comments generated during reviews/revisions of construction and use plans for each right-of-way, temporary use, or other BLM or FS permits. Will ensure that the Task Force input/comments are received by appropriate management and adequately considered or addressed in the construction and use plans.

9. Will ensure that each Task Force member receives a copy of required site-specific EAs for review and comment, and that comments are consolidated and submitted to appropriate management.

10. Will be responsible for making all arrangements for coordination with and receiving input from local citizens and special interest groups as deemed necessary by the Task Force.

11. Will arrange and coordinate the dates and logistics of the annual work plan meeting and the annual field evaluation and compliance. Will be responsible for drafting the status report, circulating to the Task Force members for comment, incorporating their comments and finalizing for Task Force signature. Will keep a chronology and photo record of project for future studies and/or potential future lawsuits.

12. Will, on at least a quarterly basis, prepare an estimate and maintain a record of reimbursable expenditures chargeable to the applicant(s) and administer the cost recovery regulations, billing the applicant(s) for the necessary costs associated with processing the right-of-way applications including subsequent monitoring of construction, operation, maintenance, and termination of any authorized project facilities as provided under Public Law 94-579 of October 21, 1976, Title V, Section 504(g) (Federal Land Policy and Management Act).

IV. GENERAL PROVISIONS

A. Each agency will be responsible for designating a representative or representatives to the Task Force and for providing management and administrative support of the Task Force and its functions. Members of the Task Force shall be designated in writing by each of the signatories of this MOU.

Letters or memoranda shall be addressed to the Chairperson of the Riley Ridge EIS Management Committee.

B. This MOU incorporates provisions from the following documents by reference for use in the Task Force functions:

1. The Riley Ridge Project Final Environmental Impact Statement (estimated completion date November 1983), and eight Technical Reports in support of the DEIS.
2. Appropriate Federal APD processing Procedures.
3. Standard Right-of-Way Stipulations prepared by the Wyoming Bureau of Land Management (Instruction Memorandum No. WY-81-413, dated August 19, 1981), as updated.

4. Land and Resource Management Plan for the Bridger-Teton National Forest and its appendices when completed. (The interim, Big Piney Unit Plan, Multiple Use Plan for Pinedale, Bridger Wilderness Management Plan.

5. BLM Pioneer Trails Management Framework Plan (dated 1974) and amendments (dated 1973 and 1981).

7. Other pertinent planning documentation in the project area.

C. Nothing in this agreement will be construed as limiting or affecting, in any way, the authority or legal responsibility of the BLM or the FS or as binding the BLM or FS to perform beyond the respective authority of each.

D. Nothing in this agreement will be construed as conflicting with existing laws and procedures governing the APD and Federal permitting process.

E. All BLM and FS activities under this MOU will be subject to available manpower and appropriations.

F. This MOU may be amended at any time by mutual agreement of all parties.

G. The period of this agreement shall be from the date of execution (not later than the date of the filing of the final EIS) until terminated by mutual agreement or on 30 days written notice from either party to the other.

Maxwell T. Lieurance 7/27/83

State Director, Bureau of Land Management, Wyoming Date

8/2/83

for Regional Forester, Forest Service, Intermountain Region Date

ATTACHMENT B

REQUIRED FEDERAL MEASURES AND APPLICANTS' STANDARD OPERATING PROCEDURES DESIGNED TO REDUCE ENVIRONMENTAL IMPACTS

B.1 Applicants' Standard Operating Procedures

B.2 Federal Regulations: Terms and Conditions

B.3 Current Lease Stipulations on Occupancy

B.4 Well Field Oil and Gas Operating Measures

B.5 General Measures

B.6 Roading Guidelines for Gas Exploration and Development Within the Riley Ridge Project Area

B.7 Erosion Control, Revegetation, and Restoration Guidelines

B.8 Required Federal Mitigation Measures

B.9 Sour Gas Trunk Line Mitigation Measures

ERRATA - ATTACHMENT B

Section B.8: Required Federal Measures Page B-59, add the following as Measure WF-15:

> Measure: Because the East Dry Basin plant location would permanently (30 - 50 years) eliminate 640 acres of critical deer and antelope winter range, Quasar would be required to investigate and evaluate the potential for mitigating the loss of critical winter range. This will be conducted in cooperation with the Wyoming Game and Fish and the BLM. All reasonable methods of mitigation, shall be summarized in a mitigation plan, which will include a description of the methods, implementation, and monitoring, and shall be included as part of Quasar's Construction and Use (CU) Plan for the treatment plant for approval by the Authorized Officer.
>
> Effectiveness: This measure would ensure that mitigation of the loss of critical winter range is investigated and evaluated, and that all reasonable methods are implemented.
>
> Application: This measure will be applied to the East Dry Basin plant site.

B.1 APPLICANTS' STANDARD OPERATING PROCEDURES

The applicants have stated that the following procedures will be followed in the construction, operation, and abandonment of the proposed Riley Ridge Project. These procedures are somewhat general; measures which are more specific to each applicant and project component will be contained in the final Construction and Use (CU) Plan.

- Drilling.
  Solid wastes generated during drilling operations and testing would be incinerated as approved by the regulatory agencies or trucked to an approved sanitary landfill. At the conclusion of the drilling operation, or as needed, ash would be removed from the incinerator and placed in an approved sanitary landfill with non-combustible wastes. Any scrap metal would be sold to a recycling firm. Sewage would be handled according to state sanitary codes. At the conclusion of drilling operations, all sewage and waste would be removed from the site and taken to an approved sewage treatment plant or sanitary landfill.

- All above-ground facilities, foundations, and salvageable materials would be removed. Soil material would be restored over the well and the site returned to its original contour as soon as the well abandonment was completed. Each completed well site would be reseeded by the next growing season using techniques and methods described in the Erosion Control, Revegetation and Reclamation Program.

- Cement plugs would be placed at designated depths in the well to prevent migration of water or hydrocarbons and to protect any freshwater aquifers from contamination in accordance with applicable state and federal regulations.

- Pipeline Construction.
  Construction activities would be confined to the construction right-of-way along the length of the gathering lines, trunk lines, and sales lines. Only those portions of the right-of-way needed for construction would be cleared of obstacles and debris.

- Blading of the right-of-way would only be done as necessary for access for machinery and equipment, or for the trenching required for the installation of pipe. To further ensure vehicle safety, it may be necessary to construct temporary bridges or culverts across creeks and gullies on the working side of the right-of-way. Excavation and grading may be necessary to decrease the gradient and increase the stability of unstable slopes, especially in the steep terrain found in the well field. Grading and cut-and-fill excavation would be performed in a manner minimizing effects on natural drainage and slope stability. On steep terrain or in wet areas where the right-of-way must be graded at two elevations, or where diversion dams must be built to facilitate construction, the areas would be stabilized and restored upon completion of construction to resemble their original condition, or as required by the surface management agency or private landowner.

- Where fences are encountered along the right-of-way, adequate bracing would be installed at each edge of the right-of-way prior to cutting the wires and installing temporary gates. The opening would subsequently be controlled as necessary during construction. No gates or cattleguards on established roads over public land would be locked, blocked, or closed by the applicants. Any cattleguard damaged would be repaired to its original condition or replaced. If a natural barrier used for livestock control were damaged during construction, the applicant would adequately fence the area to prevent the escape of livestock.

- The depth of the pipeline ditch would vary with the conditions encountered. The cover from the top of the pipe to the ground level would generally be 2.5 to 5 feet. However, in areas where rocks would be removed by blasting, the cover would be 24 inches in populated areas and 18 inches in open country. At railroad and road crossings, specifications require a minimum of 3 feet of cover over the pipe at the drainage ditches along the roadbed. Working areas of approximately 100 by 350 feet would be needed on each side of road and railroad crossings.

- Generally, ditching operations would employ ditching machines in open areas and backhoes near rivers or in areas providing little working space; however, subsurface conditions may require different types of excavation. In areas where loose or unconsolidated rock is encountered, the ditch line may be ripped mechanically. If material encountered could not be ripped, it would be blasted. Blasting would be kept to a minimum and used only when necessary. An exception to mechanical excavation would be hand-digging to locate buried utilities such as other pipelines and cables.

- If blasting is necessary, the following safety precautions would be adhered to:

  1) In areas of human use, shots would be blanketed (matted).

  2) Landowners or tenants in proximity to the shot would be notified in advance so that livestock and other property could be adequately protected.

  3) Before detonation, a clearance would be made to ensure that construction personnel and equipment and local residents are in no danger.

4) Fire protection measures would be implemented.

- Where buried utilities are encountered, representatives from the utilities would be consulted regarding the proposed route of the pipeline right-of-way.

- When crossing canals or irrigation ditches that are dredged to maintain depth, the pipeline would either span overhead or be buried underneath to a depth that would permit safe dredging operations.

- Roadbeds that support railroads would be crossed by boring a hole beneath the bed, rather than by ditching across the surface. All paved and improved roads would be crossed by boring where conditions permit. Other infrequently used, unimproved roads would be ditched and restored.

- Where the pipeline crosses rivers, the river crossing points would be carefully selected to minimize disturbance of riverbeds or banks.

- Creek flow would be maintained during pipeline construction. When crossing creeks with muddy bottoms, downstream sedimentation would be minimized by implementation of the following techniques: (1) Creeks flowing in areas where the channel is narrow would have the flow diverted around the construction area by blocking the channel upstream of the crossing site and diverting the flow through the use of pumps and/or flumes; (2) Creeks flowing in relatively flat areas where the channel is wide would have the flow diverted around the construction area by blocking a portion of the channel upstream of the crossing site. After construction is completed in that portion of the channel and the creek bottom is restored, then that portion of the channel would be reopened and the other portion blocked for construction.

- Every effort would be made to minimize the effects of construction on water flow. Upon completion of construction, the gradient of the stream would be restored as nearly as practical. Stream banks would be restored to resemble original grade, and breakers or riprap would be placed along riverbanks where necessary to control erosion.

- During construction of river crossings, the drainage or storm runoff from riverbank staging areas would be controlled via detention basins, evaporation pits, or straw bale filters to ensure that levels of suspended solids, grease, or oil would not exceed receiving water standards.

- Once the ditch has been backfilled, the right-of-way and other disturbed areas would be cleared of trash, brush, and other debris to prevent fire hazards. Some brush would be used to assist in stabilization and rehabilitation of the right-of-way. The right-of-way would be graded where needed, and all disturbed surfaces would be restored approximately to the preconstruction grade.

- Completed construction areas (including the right-of-way) and temporary access roads would be returned as nearly as practicable to the original condition or to that condition agreed upon between the applicant and the landowners or the authorized officer of the applicable agency. Right-of-way restoration techniques would be the same for federal, state, and private lands. All reasonable efforts would be made to control erosion and soil damage resulting from construction, rehabilitation, or maintenance and operations, including (but not limited to) construction of terraces, water bars, or other water diversion structures, and implementation of soil stabilization measures in erosion-prone areas.

- Routine aerial reconnaissance flights along pipelines would continue for the life of the project to check for erosion problems and revegetation success as well as possible gas leaks.

- Sulfur Pipeline.
  Overhead clearance warning structures would be placed on secondary roads prior to the sulfur pipeline crossings.

- Specific construction techniques would be selected for each creek crossing that would minimize erosion and siltation. Where the creek has a solid gravel base, permission would be requested for vehicle crossings; where an access road is in proximity, the existing access road would be used. Where the flow is too deep for vehicles to cross or the creek has a muddy bottom and there is no access road in proximity, flume pipes would be installed in the creek bottom and a roadway constructed on top for vehicle passage.

  Where the pipeline would cross creeks, the supports would be located and would be of such a depth, that high water would not affect the pipeline through scour action. Construction of creek crossings would be made in a manner that minimizes the effects of construction on water flow. The gradient of the stream would be maintained by removing all spoil from the creek bed upon completion of construction, and the creek banks would be restored.

- The right-of-way would be rehabilitated following construction. During the operation phase of the project, the right-of-way would be allowed to revegetate with shrubs; however, trees growing where they could fall across the pipeline would be removed as necessary.

- Other.
  Other warning vehicles would accompany mobile heavy equipment on roads used by the public; signs would be installed warning the public of equipment operation areas.

- Quasar, Exxon, and Northwest would dispose of miscellaneous solid waste in an off-site approved sanitary landfill which has not been identified. Scrap metal produced by project construction would be sold to a recycling firm. Used oils, lubricants, and solvents generated during both the construction and operations phase of the project would be collected in tanks on the plant site until sufficient quantities are accumulated to sell these wastes to a re-refining firm.

- When the transmission line is complete, work areas would be cleaned and all trash collected. Dirt piles would be smoothed out; areas which have been cleared may be scratched and reseeded, if needed; and any access roads would be reclaimed.

- Operation of the transmission lines would involve patrolling the lines every month by fixed-wing aircraft, every six months by helicopter, and every year by foot patrol.

CODE OF FEDERAL REGULATIONS (CFR)

These (right-of-way, permits, leases and/or unit operations -APDs) will be subject to all applicable regulations contained in 43 CFR 2800, 2880, 3100 and 30 CFR 221 as they now exist or as they may hereafter be revised. The titles of the specific regulatory sections are as follows:

43 CFR
- 2800 - Rights-of-Way, General.
- 2801 - Terms and Conditions of Rights-of-Way Grants and Temporary Use Permits.
- 2880 - Oil and Natural Gas Pipelines and Related Facilities, General.
- 2881 - Terms and Conditions of Rights-of-Way Grants, and Temporary Use Permits.
- 3100 - Oil and Gas Leasing.

30 CFR
- 221 - Oil and Gas Operating Regulations.

The holder/operator will abide by these regulations and is fully responsible for the action of his/her subcontractors. The subject regulation terms and conditions are listed in part for the benefit of the reviewing public.

43 CFR

PART 2800 - RIGHTS-OF-WAY, PRINCIPLES AND PROCEDURES

Subpart 2800 - Rights-of-Way, General.

Subpart 2801 - Terms and Conditions of Rights-of-Way Grants and Temporary Use Permits.

2801.1 Nature of Interest.

2801.101 Nature of Right-of-Way Interest.

A. All rights in public lands subject to be a right-of-way grant or temporary use permit not expressly granted are retained and may be exercised by the United States. These rights include, but are not limited to:

1. A continuing right of access onto the public lands covered by the right-of-way grant or temporary use permit, and upon reasonable notice to the holder, access and entry to any facility constructed on the right-of-way or permit area.

2. The right to require common use of the right-of-way and the right to authorize use of the right-of-way for compatible uses (including the subsurface and air space).

B. A right-of-way grant or temporary use permit may be used only for the purpose specified in the authorization. The holder may allow others to use the land as his/her agent in exercising the rights granted.

C. All right-of-way grants and temporary use permits shall be issued subject to valid existing rights.

D. A right-of-way grant or temporary use permit shall not give or authorize the holder to take from the public lands any mineral or vegetative material, including timber, without securing authorization under the Materials Act (30 U.S.C. 60 et seq.), and paying in advance the fair market value of the material cut, removed, used, or destroyed. However, common varieties of stone and soil necessarily removed in the construction of a project may be used elsewhere along the same right-of-way or permit area in the construction of the project without additional authorization and payment.

E. A holder of a right-of-way grant or temporary use permit may assign a grant or permit to another, provided the holder obtains the written approval of the authorized officer.

F. The holder of a right-of-way grant may authorize other parties to use a facility constructed, except for roads, on the right-of-way with the prior written consent of the authorized officer and charge for such use. In any such arrangement, the holder shall continue to be responsible for compliance with all conditions of the grant. This paragraph does not limit in any way the authority of the authorized officer to issue additional right-of-way grants or temporary use permits for compatible uses on or adjacent to the right-of-way, nor does it authorize the holder to impose charges for the use of lands made subject to such additional right-of-way grants or temporary use permits.

I. Each grant issued for a term of 20 years or more shall contain a provision requiring periodic review of the grant at the end of the twentieth year and at regular intervals thereafter not to exceed 10 years.

J. Each grant shall have a provision stating whether it is renewable or not and if renewable, the terms and conditions applicable to the renewal.

K. Each grant shall not only comply with the regulations of this part, but also, comply with the provisions of any other applicable law and implementing regulations as appropriate.

2801.1-2 Reciprocal Grants

When the authorized officer determines from an analysis of land use plans or other management decisions that a right-of-way for an access road is or shall be needed by the United States across lands directly or indirectly owned or controlled by an applicant for a right-of-way grant, he or she shall, if it is determined to be in the public interest, require the applicant, as a condition to receiving a right-of-way grant, to grant the United States an equivalent right-of-way that is adequate in duration and rights.

2801.2 Terms and Conditions of Interest Granted

A. An applicant by accepting a right-of-way grant, temporary use permit, assignment, amendment or renewal agrees and consents to comply with and be bound by the following terms and conditions, excepting those which the secretary may waive in a particular case:

1. To the extent possible, all state and federal laws applicable to the authorized use and such additional state and federal laws, along with the implementing regulations, that may be enacted and issued during the term of the grant or permit.

2. That in the construction, operation, maintenance, and termination of the authorized use, there shall be no discrimination against any employee or applicant for employment because of race, creed, color, sex, or national origin and all subcontracts shall include an identical provision.

3. To rebuild and repair roads, fences, and established trails that may be destroyed or damaged by construction, operation, or maintenance of the project and to build and maintain suitable crossings for existing roads and significant trails that intersect the project.

4. To do everything reasonable within his or her power, both independently and upon request of the authorized office, to prevent and suppress fires on or in the immediate vicinity of the right-of-way or permit area. This includes making available such construction and maintenance forces as may be reasonably obtained for the suppression of fires.

B. All right-of-way grants and temporary use permits issued, renewed, amended or assigned under these regulations shall contain such terms, conditions, and stipulations as may be required by the authorized officer regarding extent, duration, survey, location, construction, operation, maintenance, use, and termination. The authorized officer shall impose stipulations which shall include, but shall not be limited to:

1. Requirements for restoration, revegetation, and curtailment of erosion of the surface of the land, or any other rehabilitation measure determined necessary.

2. Requirements to ensure that activities in connection with the grant or permit shall not violate applicable air and water quality standards or related facility siting standards established by or pursuant to applicable Federal or State law.

3. Requirements designed to control or prevent damage to scenic, aesthetic, cultural, and environmental values (including damage to fish and wildlife habitat), damage to federal property and hazards to public health and safety.

4. Requirements to protect the interests of individuals living in the general area who rely on the fish, wildlife, and biotic resources of the area for subsistence purposes.

5. Requirements to ensure that the facilities to be constructed, used, and operated on the prescribed location are maintained and operated in a manner consistent with the grant or permit.

6. Requirements for compliance with State standards for public health and safety, environmental protection and siting, construction, operation, and maintenance when those standards are more stringent than Federal standards.

2801.8 Unauthorized Occupancy

Any occupancy or use of the public lands, other than casual use as set forth in 2800.0-5(m) and 2802.1 (d) of this title, without authorization shall be considered a trespass and shall subject the trespasser to prosecution and liability for the trespass. This provision applies to all unauthorized use of the public lands and precludes the issuance of a right-of-way grant of temporary use permit until the trespass case has been settled. Once the trespass case has been settled, a new grant or permit may be made by the authorized officer in accordance with the procedures set forth in this part.

PART 2880 - RIGHT-OF-WAY UNDER THE MINERAL LEASING ACT

Subpart 2880 - Oil and Natural Gas Pipelines and Related Facilities, General.

Subpart 2881 - Terms and Conditions of Rights-of-Way Grants and Temporary Use Permits.

2881.1 Nature of Interest

2881.1-1 Nature of Right-of-Way Interest

A. The United States retains a right to use a right-of-way and temporary use permit area or authorize the use of it to others in any manner not inconsistent with pipeline construction, operation, maintenance, and termination. The holder of a right-of-way grant or temporary use permit has no right to any of the product of the land including, but not limited to, timber, forage, mineral, and animal resources. The holder may not allow the use of a right-of-way or temporary use permit area by others except its contractors, subcontractors, employees, agents or servants for purposes of construction, operation, maintenance, or termination of the pipeline.

B. A holder shall not use a right-of-way and temporary use permit area for any purpose other than for the construction, operation, maintenance, and termination of the pipeline specified in the holders right-of-way grant. A holder shall not locate or construct any other pipelines, including looping lines, or other improvements within a right-of-way without first securing appropriate authorization therefore.

C. The width of a right-of-way shall not exceed 50 feet, plus the ground occupied by the pipeline (that is, the pipe and related facilities) unless the authorized officer finds and records the reasons for his finding, that a wider right-of-way is necessary for operation and maintenance after construction, or to protect the environment or public safety.

D. An applicant may apply to the authorized officer for a wider right-of-way in limited areas if necessary.

   1. For the operation and maintenance of the project after construction.

   2. To protect the environment.

   3. To provide for the public safety. If the authorized officer finds that the additional width is necessary for one of the above reasons, he may authorize a wider width. Such authorization shall include a written report recording the reasons why the additional width is necessary.

G. No purported transfer of an interest in a right-of-way grant, a right-of-way, or any portion of a pipeline system located within a right-of-way shall be valid without the prior written approval of the authorized officer. Applications for such approval shall be directed to the authorized officer. A transferee shall meet all the requirements of an original pipeline right-of-way. Grantee is bound by and shall assume all of the transferor's responsibility to the United States with respect to the transferred interest and shall agree to be bound by all terms of any outstanding right-of-way grant or temporary use permit. Applications for a transfer of interest shall be accompanied by a nonrefundable fee of $50.

2881.1-2 Nature of Temporary Use Permit Interest

A. A temporary use permit does not grant any interest in land and is revocable at will by the authorized officer.

B. The area covered by a temporary use permit shall be no greater than is necessary to accommodate the authorized use or to protect the environment or provide for public safety.

D. A temporary use permit may be renewed at the discretion of the authorized officer, but the permittee has no right of renewal. The authorized officer may modify the terms and conditions of the temporary use permit at the time of renewal.

E. A temporary use permit may be assigned at the discretion of the authorized officer, provided the use for which the permit was issued continues.

2881.1-3 Reservation of Rights to the United States.

All rights in Federal lands subject to a right-of-way grant or temporary use permit not expressly granted are retained by the United States. These rights include, but are not limited to:

A. A continuing right of access across right-of-way and temporary use permit areas to all Federal lands (including the subsurface and air space).

B. A continuing right of physical entry to any part of the pipeline system for inspection, monitoring, or for any other purpose or reason consistent with any right or obligation of the United States under any law or regulation.

C. The right to make, issue, or grant right-of-way grants, temporary use permits, easements, leases, licenses, contracts, patents, permits, and other authorizations to or with third parties for compatible uses on, under, above, or adjacent to the federal lands subject to a right-of-way grant or temporary use permit.

2881.2 Terms and Conditions of Interest Granted.

A. An applicant, by accepting a right-of-way grant or a temporary use permit, agrees and consents to comply with and be bound by the following terms and conditions, excepting those which the Secretary may waive in a particular case.

1. To the extent practicable, all state and federal laws applicable to the pipeline system construction, operation, and maintenance which is authorized and all such additional state and federal law, along with the implementing regulations, that may be enacted and issued during the term of the grant or permit.

2. That the pipeline and related facilities be subject to the express covenant that they will be modified, adapted, or discontinued within the provisions of the Act and without liability to the United States, if found by the Secretary that the use of the land for pipeline and related facility purposes conflicts with any future proposed use or occupancy of the land when it is determined that the proposal will better serve the national interest.

3. That in the construction, operation, and maintenance of the pipeline and related facilities, there shall be no discrimination against any employee or applicant for employment because of race, creed, color, sex, or national origin and all subcontracts shall include an identical provision.

4. To build and repair roads, fences, and trails that may be destroyed or damaged by construction, operation, or maintenance of the pipeline and related facilities and to build and maintain suitable crossings for roads and trails that intersect the right-of-way and related facilities.

5. To do everything reasonably within his or her power, both independently and upon request of the authorized officer, to prevent and suppress fires on or near the right-of-way and related facilities. This includes making available such construction and maintenance forces as may be reasonably obtained for the suppression of fires.

B. All right-of-way grants and temporary use permits issued, renewed, or amended under these regulations shall contain such terms, conditions, and stipulations as may be prescribed by the authorized officer regarding extent, duration, survey, location, construction, operation, maintenance, use, and termination. The authorized officer shall impose stipulations which shall include, but shall not be limited to:

1. Requirements for restoration, revegetation, and curtailment of erosion of the surface of the land.

2. Requirements to insure that activities in connection with the right-of-way grant or temporary use permit shall not violate applicable air and water quality standards or related facility siting standards established by or pursuant to applicable Federal and State law.

3. Requirements designed to control or prevent damage to the environment (including damage to fish and wildlife habitat), damage to public or private property, and hazards to public health and safety.

4. Requirements to protect the interests of individuals living in the general vicinity of the right-of-way or temporary use permit area who rely on the fish, wildlife, and biotic resources of the area for subsistence purposes.

C. Right-of-way grants or temporary use permits issued, renewed or amended under this title shall include requirements which comply with applicable Federal and State law that will protect the safety and health of pipeline workers and the general public, including, but not limited to protection against the sudden rupture and slow degradation of the pipeline. Applicants and holders shall design, construct, operate, and maintain all facilities in accordance with applicable Federal and State law governing pipelines and pipeline construction.

2881.3 Unauthorized Occupancy

No holder of a right-of-way grant or temporary use permit shall use or knowingly allow any other person to use the right-of-way or temporary use permit area for any purpose not authorized by the right-of-way grant or temporary use permit. Any person occupying or using Federal lands without authorization may be subject to prosecution under applicable law.

Subpart 2883 - Administration of Rights Granted

§ 2883.1-4 Liability.

(a) Except as provided in paragraph (f) of this section holders shall be fully liable to the United States for any damage or injury incurred by the United States in connection with the use and occupancy of the right-of-way or permit area.

(b) Except as provided in paragraph (f) of this section, holders shall be held to a standard of strict liability for any activity within a right-of-way or permit area which the authorized officer determines, in his discretion, presents a foreseeable hazard or risk of damage or injury to the United States. The activities and facilities to which such standard shall apply shall be specified in the right-of-way grant or temporary use permit. Strict liability shall not be imposed for damage or injury resulting primarily from an act of war or the negligence of the United States. To the extent consistent with other laws, strict liability shall extend to costs incurred by the United States for control and abatement of conditions, such as fire or oil spills, which threaten lives, property or the environment, regardless of whether the threat occurs on areas that are under Federal jurisdiction. Stipulations in right-of-way grants and temporary use permits imposing strict liability shall specify a maximum limitation on damages which, in the judgment of the authorized officer, is commensurate with the foreseeable risks or hazards presented. The maximum limitation shall not exceed $1,000,000 for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

(c) In any case where strict liability is imposed and the damage or injury was caused by a third party, the rules of subrogation shall apply in accordance with the law of the jurisdiction in which the damage or injury occurred.

(d) Except as provided in paragraph (f) of this section, holders shall be fully liable for injuries or damages to third parties resulting from activities or facilities on lands under Federal jurisdiction, in accordance with the law of the jurisdiction in which the damage or injury occurred.

(e) Except as provided in paragraph (f) of this section, holders shall fully indemnify or hold harmless the United States for liability, damage or claims arising in connection with the use and occupancy of right-of-way or permit areas.

(f) If a holder is a State or local government, or agency or instrumentality thereof, it shall be liable to the fullest extent its laws allow at the time it is granted a right-of-way grant or temporary use permit. To the extent such a holder does not have the power to assume liability, it shall be required to repair damage or make restitution to the fullest extent of its powers at the time of any damage or injury.

(g) All owners of any interest in, and all affiliates or subsidiaries of any holder of a right-of-way grant or temporary use permit, except for corporate stockholders, shall be jointly and severally liable to the United States in the event that a claim cannot be satisfied by a holder.

(h) Except as otherwise expressly provided in this section, the provisions in this section for a remedy is not intended to limit or exclude any other remedy.

(i) If the right-of-way grant or temporary use permit is issued to more than one holder, they shall be jointly and severally liable under this section.

PART 3100 - OIL AND GAS LEASING

Subpart 3105 - Cooperative Conservation Provisions

3105.4-1 Rights-of-Way

Rights-of-way for oil and gas pipelines may be granted as provided for in Group 2800 of this chapter.

Subpart 3109 - Surface Management Requirements

3109.2-1 Bureau of Land Management Stipulations

The Bureau of Land Management may require such special stipulations as are necessary for the protection of the lands embraced in any permit or lease. (See Montana Power Decision A 30310 December 3, 1965, I.M. No. 85-500 December 23, 1966).

30 CFR

PART 221 - OIL AND GAS OPERATING REGULATIONS

Part 221.1 - Purpose and Scope

The regulations in this part govern operations associated with the exploration, development, and production of oil and gas deposits from leases issued or approved by the United States, restricted Indian land leases, and those under the jurisdiction of the Secretary of the Interior by law or administrative arrangement, including the National Petroleum Reserve in Alaska. They are intended to promote the orderly and efficent exploration, development, and production of oil and gas.

Part 221.20 General Requirements

The lessee shall comply with applicable laws and regulations; with the lease terms, Onshore Oil and Gas Orders, NTLs; and with other orders and instructions of the supervisor. These include, but are not limited to, conducting all operations in a manner which ensures the proper handling, measurement, disposition, and site security of leasehold production; which protects other natural resources and environmental quality; which protects life and property; and which results in maximum ultimate economic recovery of oil and gas with minimum waste and with minimum adverse effect on ultimate recovery of other mineral resources.

Part 221.30 Environmental Obligations

A. The lessee shall conduct operations in a manner which protects the mineral resources, other natural resources, and environmental quality. In that respect, the lessee shall comply with the pertinent orders of the Supervisor and other standards and procedures as set forth in the applicable laws, regulations, lease terms and conditions, and the approved drilling plan or subsequent operations plan. Before approving any Application for Permit to Drill submitted pursuant to Part 221.23, or other plan requiring environmental review, the Supervisor shall prepare an environmental record of review or an environmental assessment, as appropriate. These environmental documents will be used in determining whether or not an environmental impact statement is required and in determining any appropriate terms and conditions of approval of the submitted plan.

B. The lessee shall exercise due care and diligence to assure that leasehold operations do not result in undue damage to surface or subsurface resources or surface improvements. All produced water must be disposed of by injection into the subsurface, by approved pits, or by other methods which have been approved by the Supervisor. Upon the conclusion of operations, the lessee shall restore or rehabilitate the disturbed surface in a manner approved or reasonably prescribed by the Supervisor.

C. All spills or leakages of oil, gas, produced water, toxic liquids, or waste materials, blowouts, fires, personal injuries, and fatalities shall be reported by the lessee in accordance with these regulations and as prescribed in applicable order or notices. The lessee shall exercise due diligence in taking necessary measures, subject to approval by the Supervisor, to control and remove pollutants and to extinguish fires. A lessee's compliance with the requirements of the regulations in this part shall not relieve the lessee of the obligation to comply with other applicable laws and regulations.

D. When reasonably required by the Supervisor, a contingency plan shall be submitted describing procedures to be implemented to protect life, property, and the environment.

E. The lessee's liability for damages to third parties shall be governed by applicable law.

Part 221.31 Safety Precautions

The lessee shall perform operations and maintain equipment in a safe and workmanlike manner. The lessee shall take all precautions necessary to provide adequate protection for the health and safety of life and the protection of property. Compliance with health and safety requirements prescribed by the Supervisor shall not relieve the lessee of the responsibility for compliance with other pertinent health and safety requirements under applicable laws or regulations.

B.3 CURRENT LEASE STIPULATIONS ON OCCUPANCY

The leases within the proposed Riley Ridge well field which would be restricted by stipulations on occupancy are listed by location in the following table. These stipulations are designed to protect surface resources such as soils, water, and wildlife by restricting periods of activity and areas of disturbance.

SPECIAL LEASE STIPULATIONS

Lease Locations	Special Stipulations
T24N, R113W Sec 8, Lots 2,3	(1) No occupancy/surface disturbance within 300 feet of irrigation ditch
T26N, R115W Sec 1, NE¼SW¼, S½SW¼ Sec 2, Lots 5,6,11,12, S½NE¼, N½SE¼ Sec 12, Lots 1,2,3,4, W½E½, E½W½, NW¼NW¼ Sec 13, Lots 1,5,6,8, NW¼NE¼, SW¼SE¼	(2) No occupancy/surface disturbance on slopes in excess of 35 percent (3) No exploration/development activity from April 1 to May 14 (does not apply to operation/maintenance of producing wells)
T27N, R114W Sec 5, Lots 17,18,22 Sec 8, Lot 1	(3)[1] (4) No occupancy/surface disturbance on slopes in excess of 25 percent
T27N, R114W Sec 8, Lots 7,14, SW¼NE¼, W½SE¼ Sec 9, SW¼SW¼	(5) No occupancy/surface disturbance on slopes in excess of 40 percent (6) No exploration/development activity from November 1 to April 30 (7) No occupancy/activity on Sec 8, W½SW¼SE¼
T27N, R114W Sec 17, Lot 8 Sec 21, E½, S½SW¼ Sec 28, all Sec 29, Lots 1,10,11,20	(2) (3)
T27N, R114W Sec 22, SW¼NE¼, NW¼NW¼, S½NW¼, SW¼, W½SE¼	(5) (6)
T28N, R114W Sec 8, Lot 1	(5) (8) No exploration or development activity from March 1 to May 31 (9) No drilling within 1,000 feet of live water
T28N, R114W Sec 9, S½ Sec 10, SW¼	(10) No occupancy/surface disturbance (rare and endangered fish area)
T28N, R114W Sec 21, SW¼NW¼	(8) (11) No occupancy/surface disturbance within 1,000 feet of Sawmill or Hagarty Creeks
T28N, R114W Sec 27, SW¼	(8) (12) No drilling/surface disturbance within 1,000 feet of Black Canyon Creek
T29N, R114W Sec 1, Lots 1,2,3,4, S½NW¼, N½SW¼ Sec 2, Lots 1,4, SE¼NE¼, SW¼NW¼, NE¼SW¼ Sec 11, SW¼NE¼, SE¼ Sec 12, NW¼SW¼, S½S½ Sec 13, all	(8) (13) No occupancy/surface disturbance within 1,320 feet of the Lander Cutoff-Oregon Trail (14) No occupancy/surface disturbance within 1,000 feet of South Piney, Fish, or Spring Creeks

SPECIAL LEASE STIPULATIONS (CONTINUED)

Lease Locations	Special Stipulations
T29N, R114W Sec 3, Lots 1,2,3,4, S½N½, SW¼ Sec 4, Lots 1,2,3, SE¼NW¼	(5) (8) (13) (15) No use of Lander Cutoff as access road
T29N, R114W Sec 4, Lot 4, S½NE¼, SW¼NW¼, S½ Sec 5, Lots 1,2,3, S½N½, S½	(8) (13) (15) (16) No occupancy/surface disturbance within 1,000 feet of South Piney Creek
T29N, R114W Sec 5, Lot 4 Sec 6, Lots 1,2, S½NE¼, SE¼ Sec 7, E½ Sec 9, SE¼SE¼ Sec 17, all Sec 18, SE¼ Sec 19 E½	(5) (17) No occupancy/surface disturbance within 500 feet of Spring and South Piney Creeks
T29N, R114W Sec 9, N½ Sec 14, E½	(5) (8) (15) (18) No occupancy/surface disturbance within 500 feet of South Piney Creek
T29N, R114W Sec 9, SW¼, N½SE¼, SW¼SE¼ Sec 15, W½	(5) (8) (13) (15)
T29N, R114W Sec 10, all Sec 15, E½	(16) (19) May prohibit exploration/development during wet or heavy snow periods
T29N, R114W Sec 10, all Sec 15, E½	(16) (19)
T29N, R114W Sec 11, NE¼NW¼	(18)
T29N, R114W Sec 14, W½	(16) (19)
T29N, R114W Sec 18, NE¼ Sec 20, all	(20) No occupancy/surface disturbance within 500 feet of Spring Creek
T29N, R114W Sec 19, Lots 1,2,3,4, E½W½ Sec 30, Lots 1,2,3,4, E½W½	(3) (4) (20)
T29N, R114W Sec 21, all Sec 28, all Sec 29, all	(5) (17)

SPECIAL LEASE STIPULATIONS (CONTINUED)

Lease Locations	Special Stipulations
T29N, R114W Sec 22, all Sec 23, W½ Sec 27, N½	(5) (8)
T29N, R114W Sec 23, E½	(5) (17)
T29N, R114W Sec 24, NW¼, S½SE¼	(8) (9) (21) No occupancy/surface activity on S½SE¼
T29N, R114W Sec 25, W½NE¼, W½	(8) (19) (22) No timber cut to install mud sumps or drill site locations
T29N, R114W Sec 27, S½	(5) (8)
T29N, R115W Sec 1, all Sec 2, all Sec 11, E½, E½W½ Sec 14, NE¼, E½NW¼, S½	(23) No surface occupancy of Sec 11, E½, E½W½ (24) Unstable soils restriction (25) No surface occupancy within: a. 500 feet of roads/highway centerline; b. 200 feet of trails centerline; c. 500 feet of high water line of streams, lakes, ponds, reservoirs; d. 400 feet of springs; e. 400 feet of improvements.
T29N, R115W Sec 12, all	(25)
T29N, R115W Sec 13, all	(25)
T30N, R114W Sec 1, Lots 3,4, SW¼	(26) No exploration/development December 1 to March 31
T30N, R114W Sec 2, Lot 2, SW¼NE¼, SW¼, W½SE¼ Sec 3, Lots 1,2, S½NE¼, SW¼, S½SE¼, NW¼SE¼	(8)
T30N, R114W Sec 2, Lots 3,4, S½NW¼ Sec 3, Lots 3,4, S½NW¼	(8)
T30N, R114W Sec 10, N½, N½S½, S½SW¼, SW¼SE¼	(8)
T30N, R114W Sec 11, NW¼	(27) No exploration/development from November 16 to May 14
T30N, R114W Sec 11, SE¼ Sec 12, SE¼NE¼, S½NW¼, W½, SW¼, SE¼SW¼, S½SE¼	(28) No occupancy/surface activity from December 1 to April 30 (29) No occupancy/activity on Sec 12, SE¼NE¼, S½SE¼

SPECIAL LEASE STIPULATIONS (CONTINUED)

Lease Locations	Special Stipulations
T30N, R114W	
Sec 12, N½NW¼	(8)
T31N, R114W	(19)
Sec 28, SE¼SW¼	(30) No occupancy/surface disturbance within 1,000 feet of North Piney Creek
T30N, R114W	
Sec 13, S½SE¼	(6)
Sec 14, E½NE¼	
T30N, R114W	
Sec 14, NW¼NE¼, NE¼NW¼, E½SE¼	(28)
T30N, R114W	
Sec 15, S½NE¼	(6)
Sec 17, SW¼	
Sec 20, N½, SW¼	
Sec 23, S½SW¼	
Sec 26, E½, NE¼NW¼	
T30N, R114W	
Sec 23, SW¼SE¼	(8)
Sec 24, NE¼, NE¼NW¼	(31) No occupancy/surface disturbance within 1,000 feet of Middle Piney or Fish Creeks
Sec 35, NE¼, E½NW¼, NE¼SW¼, E½SE¼, NW¼SE¼	
T30N, R114W	
Sec 26, NW¼NW¼, S½NW¼, SW¼	(2)
Sec 30, SE¼NE¼	(3)
T30N, R114W	
Sec 27, S½N½, N½S½, S½SE¼	(32) No drilling or storage facilities within 500 feet of live water or the reservoir
T29N, R115W	(25)
Sec. 7, Lots 1, 2, 3, 4, E½, E½W½	(33) No surface occupancy that will alter wilderness until ES is prepared and propriety determined.
Sec. 8, all	
Sec. 17, W½	
Sec. 18, Lots 1, 2, 3, 4, E½, E½W½	
T30N, R115W	(25)
Sec. 13, Lots 1, 2, W½NE¼	(33)
Sec. 24, Lots 1, 2, 3, 4, W½E½	
T29N, R115W	(25)
Sec. 5, all	(33)
Sec. 6, Lots 1, 2, 3, 4, N½NE¼, E½W½, E½SE¼	
T30N, R115W	
Sec. 30, Lots 1, 2, 3, 4, E½, E½W½	
Sec. 31, Lots 1, 2, 3, 4, E½, E½W½	
T30N, R115W	(25)
Sec. 25, NW¼	(33)
T30N, R115W	(25)
Sec. 12, Lots 1, 2, 3, 4, W½E½, SW¼	(33)
T30N, R115W	(25)
Sec. 13, N½SW¼	(33)
Sec. 24, N½SW¼	
Sec. 25, Lot 2	

SPECIAL LEASE STIPULATIONS (CONTINUED)

Lease Locations	Special Stipulations
T30N, R115W Sec. 1, Lots 1, 2, 3, 4, 5, 6, 7, SW¼NE¼, S½NW¼, SW¼, W½SE¼ T31N, R115W Sec. 36, all	(25) (33)
T30N, R115W Sec. 2, SE¼ Sec. 11, NE¼ Sec. 12, NW¼	(25)
T30N, R115W Sec. 3, Lots 1, 2, S½NE¼ Sec. 10, NE¼, E½SE¼ Sec. 23, E½ Sec. 26, E½, SW¼ Sec. 27, E½ Sec. 35, all	(25) (33)
T30N, R115W Sec. 13, NW¼, S½SW¼ Sec. 14, SW¼ Sec. 23, NW¼ Sec. 24, NW¼, S½SW¼ Sec. 25, Lots 1, 3, 4, W½E½, SW¼	(25)
T29N, R115W Sec. 3, all Sec. 4, E½, NW¼, N½SW¼, SE¼SW¼	(25)
T29N, R115W Sec. 6, S½NE¼, W½SE¼ Sec. 31, NE¼	(25)
T30N, R115W Sec. 2, Lots 1, 2, 3, 4, S½N½, SW¼ Sec. 3, SE¼ Sec. 10, W½SE¼ Sec. 11, W½, SE¼ Sec. 15, E½ Sec. 22, E½ Sec. 23, SW¼ Sec. 26, NW¼ T31N, R115W Sec. 35, NE¼	(25) (34) No surface occupancy Middle Piney summer home area and Sacajawea campground. (35) Lease area contains critical habitat for certain wildlife species. Proposed activities will be discussed before entry.
T30N, R115W Sec. 14, NE¼, S½SE¼	(25)
T30N, R115W Sec. 14, NW¼, N½SE¼ Sec. 22, W½ Sec. 27, W½ Sec. 34, all Sec. 36, Lots 1, 2, 3, 4, W½E½, W½	(25) (33)
T30N, R115W Sec. 16, all Sec. 20, all Sec. 21, all Sec. 29, all Sec. 33, all	(24) (25) (35) (36) No surface occupancy because high surface runoff, slope failure, and proposed bighorn sheep range.

SPECIAL LEASE STIPULATIONS (CONTINUED)

Lease Locations	Special Stipulations
T30N, R115W Sec. 3, Lots 3, 4, S½NW¼, SW¼	(25) (34)
T29N, R115W Sec. 19, Lots 1, 2, 3, 4, E½, E½W½ Sec. 20, W½ Sec. 29, W½ Sec. 30, Lots 1, 2, 3, 4, E½, E½W½ T29N, R116W Sec. 24, all	(24) (25) (35) (37) No surface occupancy allowed within 100 feet of centerline of the Lander-Oregon Trail in Lots 3, 4, E½SW¼, W½SE¼, Sec. 19.
T29,R115W Sec. 9, all Sec. 10, all	(25) (38) Surface use restriction due to steep side slopes and adjacent to riparian zones.
T30N, R115W Sec. 5, Lots 1, 2, 3, 4, S½N½, S½ Sec. 8, Lots 1, 2, 3, 4, E½, N½NW¼, SE¼SW¼ Sec. 9, W½	(25) (39) Surface use restrictions due to steep side slopes, riparian zone, avalanche hazard, high surface runoff.
T30N, R115 W Sec. 9, E½ Sec. 10, W½ Sec. 17, all Sec. 28, all Sec. 32, all	(25) (40) Surface use restrictions due to steep access, riparian zone, also area of proposed planting of mountain sheep.

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[1] Stipulations are described as they first appear in the table; thereafter, they are referenced by number.

B.4 WELL FIELD OIL AND GAS OPERATING MEASURES

1. There shall be no deviation from the proposed drilling and/or workover program as approved. Safe drilling and operating practices must be observed. All wells, whether drilling, producing, suspended, or abandoned, shall be identified in accordance with 43 CFR 3162.6. Any changes in operations must have prior approval of the Authorized Officer. Pressure tests are required before drilling out from under all casing strings set and cemented in place. Blowout preventer (BOP) controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned. BOPs will be inspected and operated at least daily to insure good mechanical working order, and this inspection recorded on the daily drilling report. BOPs will be pressure tested before drilling casing cement plugs. All BOP pressure tests must be recorded on the daily drilling report. The Authorized Officer's designated representative will be notified in advance of pressure tests.

2. All shows of fresh water and minerals will be reported and protected. A sample will be taken of any water flows and furnished the Authorized Officer for analysis. All oil and gas shows will be adequately tested for commercial possibilities, reported, and protected.

3. No location will be constructed or moved, no well will be plugged, and no drilling or workover equipment will be removed from a well to be placed in a suspended status without prior approval of the Authorized Officer. If operations are to be suspended for more than 30 days, prior approval must be obtained and notification given before resumption of operations.

4. In the event abandonment of the hole is desired, an oral request may be granted but must be followed within 15 days with a "Notice of Intention to Abandon" (Form 3160-5). Unless the plugging is to take place immediately upon receipt of oral approval, the Authorized Officer must be notified at least 48 hours in advance of the plugging of the well, in order that a representative may witness plugging operation. The "Subsequent Report of Abandonment" (Form 3160-5) must be submitted within 15 days after the actual plugging of the well bore, reporting where the plugs were placed, and the current status of the surface restoration. If surface restoration has not been completed at that time, a follow-up report on Form 3160-5 should be filed when all surface restoration work has been completed and the location is considered ready for final inspection.

5. The spud date will be reported orally to the Authorized Officer within 48 hours after spudding. If the spudding occurs on a weekend or holiday, wait until the following regular workday to make this report. Periodic drilling progress reports must be filed directly with the Authorized Officer on a frequency and form or method as may be acceptable.

6. In accordance with "Notice to Lessee - Procedures for Reporting and Accounting for Royalties" (NTL-1) each well must be reported on Form 9-239 "Monthly Report of Operations and Production", starting with the month in which operations commence and continuing each month until the well is physically plugged and abandoned. This report should be filed in duplicate directly with the BLM District Office-Division of Minerals, Rock Springs, Wyoming.

7. Any change in the program must be approved by the Authorized Officer. "Sundry Notices and Reports on Wells" (Form 3160-5) must be filed for all changes of plans and other operations in accordance with 43 CFR and 3162.3-2. Emergency approval may be obtained orally, but such approval does not waive the written report requirement. Any additional construction, reconstruction, or alterations of facilities, including roads, gathering lines, batteries, etc., which will result in the disturbance of new ground will require the filing of a suitable plan pursuant to Onshore Oil and Gas Order No. 1 and prior approval by the Authorized Officer.

8. Whether the wells are completed as dry holes or as producers, the "Well Completion and Recompletion Report and Log" (Form 3160-4) will be submitted not later than 30 days after completion of the well or after completion of operations being performed, in accordance with 43 CFR 3162.4-1. Two copies of all logs run, core descriptions, core analyses, well-test data, geologic summaries, sample descriptions, and all other surveys or data obtained and compiled during the drilling, workover, and/or completion operations, will be filed with Form 3160.4. Samples (cuttings, fluid, and/or gas) will be submitted only when requested by the Authorized Officer.

9. Significant surface values are involved at these locations. Accordingly, the operator must notify the Authorized Officer's representative at least 3 days prior to commencing field operations to allow him/her to be present for consultation during the construction of roads and well pads.

10. If a replacement rig is contemplated for completion operations, a "Sundry Notice" (Form 3160-5) to that effect must be filed for prior approval of the Authorized Officer, and all conditions of the APD are applicable during all operations conducted with the replacement rig.

11. Pursuant to "Notice to Lessee - Disposal of Produced Water" (NTL-2B) requirements for new wells, these APDs are authorization for unlined pit disposal of the water produced from these wells for a period of 90 days from the date of initial production for sales purposes. During this period, an application for approval of the permanent disposal method, along with the required water analysis and other information must be submitted for the Authorized Officer's approval.

12. APDs will be valid for a period of one year from the date of approval. If the permit terminates, any surface disturbance created under the APD must be rehabilitated in accordance with the approved plan.

13. All tank batteries constructed must be surrounded by a fire wall of sufficient capacity to contain the storage capacity of the batteries adequately.

14. Discharges, spills, fires, accidents, or blowouts must be reported to the Authorized Officer in accordance with "Notice to Lessee - Reporting of Undesirable Events" (NTL-3A).

15. Venting or flaring of hydrocarbons will be in accordance with "Notice to Lessee - Venting or Flaring of Gas or Oil" (NTL-4A) and must receive prior approval of the Authorized Officer.

16. The Authorized Officer should be notified sufficiently in advance of actual well plugging work so that a representative may have an opportunity to witness the well plugging operation.

17. Upon completion of approved plugging, the operator will erect the regulation marker in accordance with 43 CFR 3162.6 and clean up the location. The marker should not be less than 4 inches in diameter, 10 feet in length with approximately 4 feet above general ground level, and the top plugged or capped. All necessary pits or holes, including the cellar, must be backfilled immediately upon abandonment.

18. The following minimum information shall be permanently placed on the marker with a plate, cap, or beaded-on with a welding torch:
    - Name of the Operator.
    - Lease serial number.
    - Well number.
    - Well location by 1/4 1/4 section or footage, township, and range.

19. Final release from liability will be issued by the Authorized Officer when all the provisions of the APD, including incorporation of the Erosion Control, Revegetation, and Restoration Guidelines (Appendix B-E), and Surface Owner's Rehabilitation Plan are complete.

20. Holder shall give immediate notice of any spill or leakage, in violation of 43 CFR 110.5, of oil or other pollutant from the pipeline to: 1) the Authorized Officer; and 2) such other federal and state officials as are required by law to be given such notice. Any oral notice shall be confirmed in writing within 72 hours of any occurrence.

1. A Notice to Proceed requirement will be appended to these (rights-of-way, grants, permits) stipulating that no construction or use shall occur until detailed construction and use plans have been received and approved by the authorized officer.

2. All activities associated with the project will be conducted in a manner that will avoid or minimize degradation of air, land, and water quality. In the construction, operation, maintenance, and termination of the projects, activities will be performed in accordance with applicable air and water quality standards, and related plans of implementation, including but not limited to, the Clean Air Act, as amended (42 USC 1321) and the Clean Water Act as amended (USC 1251).

3. Permittees and other regular users of public lands affected by construction of the projects will be notified in advance of any construction activity that may affect their businesses or operations. This will include, but not be limited to, signing of temporary road closures, and notification of proposed removal and/or cutting of fences, and disturbances to range improvements or other use-related structures.

4. During the final survey of the linear facilities (pipelines, transmission lines, etc.), the centerline and outside boundaries of the linear facilities will be staked and flagged. Stakes will be no more than 200 yards apart on open rangelands and a maximum of 100 feet apart on forested lands. Holder/operator name and station numbers of the survey will be written on each stake or hub. Where the linear facilities parallel an existing line, the existing line will be flagged where necessary to avoid disturbance of the existing line. The Authorized Officer reserves the right to make adjustments in right-of-way alignment as may be necessary to minimize environmental impacts.

5. The Company shall, at all times during construction, maintenance, and operation, maintain satisfactory spark arrestors on all steam and internal combustion engines and on all flues used in operations under this grant.

6. The Company shall furnish the Authorized Officer with engineering drawings of the existing ground profile and plan, and profile views of the facilities to be constructed. These drawings must portray typical cross sections (i.e., cut, fill, bench sections, etc.) at representative points along or within the right-of-way.

7. Prior to placing the pipeline system in operation, the Holder shall inspect all new main line girth welds using radiographic or other techniques approved by the Authorized Officer.

   Holder agrees that any welding required on the converted line on Federal lands shall be inspected using radiographic or other techniques approved by the Authorized Officer.

Holder shall provide for inspection of pipeline system construction to ensure compliance with the approved design specifications and these stipulations.

8. At least one year prior to termination or to abandonment of the facilities authorized by this grant, the Holder shall contact the Authorized Officer to arrange a joint inspection of the right-of-way. The inspection will be held to agree on an acceptable abandonment and rehabilitation plan. The Authorized Officer must approve the plan in writing prior to the Holder commencing any abandonment and/or rehabilitation activities. The plan may include removal of drainage structures or surface material; recontouring; replacement of topsoil; seeding, mulching, etc.

9. The Company shall install and use Federal Communication Commission approved radio equipment in such a way that it will not interfere with the operation of other users' equipment. If, however, there is a radio or electronic interference with other users' operation which is traceable to the grantee's equipment, the Company shall immediately make such modifications to its equipment as shall eliminate the cause of interference at no cost to the Government or will discontinue use of said equipment until cause of interference has been eliminated.

10. Prior to the beginning of operations, the Holder shall submit to the Authorized Officer a certification of construction, verifying that the facility has been constructed and tested in accordance with the terms of the right-of-way grant, and in compliance with the required plans and specifications, and applicable federal and state laws and regulations. An "as built" survey map will be submitted to the Authorized Officer within 60 days after construction is completed.

11. Upon receipt of a certification of construction, when all development and rehabilitation have been completed, a joint compliance check of the right-of-way shall be made by the Company and the Authorized Officer or designated representative to determine compliance with the terms and conditions of the grant. The Company shall perform, at its own expense, any required modifications or additional reclamation work for compliance with the terms of the grant.

12. The Company shall conduct all activities directly or indirectly associated with the construction, operation, and maintenance of this facility within the limits of these (rights-of-way, permits). In the event that areas outside of the (rights-of-way, permits) are needed, the Company shall obtain a separate authorization for that use.

13. The Holder shall comply with the applicable federal and state laws and regulations concerning the use of pesticides (i.e., insecticides, herbicides, fungicides, rodenticides, and other similar substances) in all activities/operations under this Grant. The Holder shall obtain from the Authorized Officer approval of a written plan prior to the use of such substances. The plan should be submitted no later than December 1 of any calendar year that covers the proposed activities for the next fiscal year (i.e., December 1, 1983, deadline for a fiscal year 1985 action). If need for emergency use of pesticides is

identified, the use must be approved by the Authorized Officer. The use of substances on or near the right-of-way shall be in accordance with the approved plan. A pesticide shall not be used if the Secretary of the Interior has prohibited its use. A pesticide shall be used only in accordance with its registered uses and within other limitations if the Secretary has imposed limitations. Pesticides shall not be permanently stored on public lands authorized for use under this Grant.

14. The Company shall construct, operate, and maintain the facilities and structures within these (grants, permits) in strict conformity with the descriptive and technical data which was furnished the BLM or the FS in connection with the application for these (grants, permits). Any relocation, additional construction, or use which is not in accord with such data may not be initiated without the prior written approval of the Authorized Officer. A copy of the complete application and a copy of the (grant, permit) stipulations shall be available on location during construction and rehabilitation to all supervisory personnel and to the Authorized Officer. Noncompliance with the above will be grounds for the Authorized Officer to shut down the operation until compliance is obtained.

15. The Company shall schedule and attend a preconstruction conference with the Authorized Officer and his representative prior to commencing any construction activities on these (rights-of-way, permits). The Company or his representative and all of his contractors or agents involved with construction under these (rights-of-way, permits) shall attend this conference. The Company shall contact the Authorized Officer or his representative at least 10 working days (2 weeks) prior to the anticipated start of construction to schedule this conference.

16. The requirements within the Erosion Control, Revegetation, and Reclamation Guidelines and FS-BLM Roading Guidelines for Oil and Gas Development will be followed in the development of the CU Plans and in developing procedures for the APDs.

17. Holder shall conduct all construction, operation, and maintenance activities in a manner that will avoid or minimize degradation of air, land, and water quality. Toxic material shall not be released in any lake or water drainage. All construction work and subsequent use of the right-of-way shall be consistent with applicable federal, state, and local laws and regulations relating to safety, water quality, and public health. Unless otherwise approved in writing by the Authorized Officer, dikes or cofferdams shall be installed to separate concrete work areas from lakes or streams during construction. Mobile ground equipment shall be kept within the right-of-way and out of the waters of lakes, streams or rivers except as permitted by the Authorized Officer.

18. It shall be the responsibility of the Holder to comply with the construction practices and mitigating measures established by 33 CFR 323.4 which set forth the parameters of the "nationwide permit" required by Section 404 of the Federal Water Pollution Control Act. If the proposed action exceeds the parameters of the nationwide permit, the Holder shall obtain an "individual permit" from the appropriate

office of the Corps of Engineers and provide BLM a copy of that permit prior to commencing actual construction. Failure to comply with this requirement shall be cause for revocation of this right-of-way grant.

19. The power transmission and distribution lines shall be designed and constructed in accordance with accepted standards and specifications for power transmission lines of similar voltage, capacity, and purpose. The Company shall place and maintain suitable structures and devices to reduce to a reasonable degree, the liability of contact between its power transmission line and telegraph, telephone, signal, or other power transmission lines heretofore constructed and shall also place and maintain suitable structures and devices to reduce to a reasonable degree, the liability of any structures or wires falling or obstructing traffic or endangering life on highways or roads.

20. Natural phenomena which occur on government land, such as avalanches, rising waters, high winds, falling limbs or trees, and other hazards, present risks to the Company's property which the Company assumes. The Company has the responsibility of inspecting the site, right-of-way, and immediate adjoining area for dangerous trees, hanging limbs, and other evidence of hazardous conditions and, after securing permission from the FS or BLM, of removing such hazards in order to protect the Company's improvements.

21. The Company shall perform all work with explosives and flammable materials in such a manner as not to endanger life or property. All storage places for explosives and flammable material shall be marked "DANGEROUS". The method of storing and handling explosives and flammable materials shall conform to recommended procedures contained in the "Blasters Handbook" published by E. I. du Pont de Nemours and Company, and in all federal, state, and local laws and regulations.

22. These (rights-of-way, permits) do not convey access across private, patented, state or fee lands. These (rights-of-way, permits) are issued on the condition that the Company has secured or will secure the necessary additional rights-of-way. The Company shall be required to show that they have secured consent for access across private, patented, state, or fee land prior to BLM-FS granting rights-of-way or permits.

23. No signs or advertising devices shall be erected on the area designated by this permit or highways leading thereto, without prior approval by the FS or BLM as to location, design, size, color, and message. Erected signs shall meet standards provided by the Authorized Officer and be maintained or renewed as necessary.

24. The Company shall protect all survey monuments, witness corners, reference monuments, and bearing trees within these (rights-of-way, permits) against disturbance during construction, operation, maintenance, and rehabilitation. If any monuments, corners, or accessories are destroyed, obliterated, or damaged during construction, operation, or maintenance, Holder shall secure the services of a Registered Land Surveyor to restore the disturbed monuments, corners, or accessories, at the same location, using surveying procedures found in the

Manual of Surveying Instructions for the Survey of the Public Lands of the United States, latest edition. Holder shall record such survey in the appropriate county and shall send a copy to the Wyoming State BLM Office, P.O. Box 1828, Cheyenne, Wyoming 82001.

25. Garbage and other refuse will be stored in containers at all times and disposed of at least once a week in authroized county-approved sanitary site or landfill. Used engine oil which is changed on federal lands will be stored in suitable containers and delivered to secondary refineries. No fuel, oil, or other hydrocarbon spills are permitted. If such a spill accidentally occurs, the Authorized Officer will be notified immediately and corrective measures undertaken as directed.

26. Within 30 days after conclusion of construction and operation, all construction materials related litter and debris shall be disposed of in accordance with instructions from the Authorized Officer.

27. Under the terms of the Endangered Species Act of 1973, the Company will conduct surveys, no more than one year prior to disturbance, to determine if listed species or their habitats might be present on areas to be disturbed by any of the proposed action, or alternatives, regardless of land ownership. If it is determined that listed species or their habitats might be present and could be affected by the proposals, appropriate consultations with the U.S. Fish and Wildlife Service will be conducted by the federal authorizing agency. No activities will be authorized until consultation is complete as specified by Section 7(c) of the consultation process which would specify the mitigation measures to be carried out. The Biological Opinion issued by the Fish and Wildlife Service as a result of the consultation process will specify the mitigation measures to be carried out by the Company.

    The Holder shall develop a conservation plan consistent with the FWS Biological Opinion that will ensure the continued existence of threatened or endangered species is not jeopardized or that their critical habitat is not destroyed or adversely modified.

28. Any active golden eagle nest found within 1 mile of project activities will be protected from harassment during the critical nesting period because of provisions established by the Bald Eagle Protection Act which requires protection of the golden eagle and its nests.

29. For transmission or powerlines, the Company shall meet all requirements contained in Suggested Practices for Raptor Protection on Powerlines. Prior to construction, the Company shall provide the Authorized Officer with drawings which show phase spacings, configurations, and grounding practices for this power distribution line. The Company shall modify any structures not in conformance with Suggested Practices for Raptor Protection on Powerlines as determined by the Authorized Officer.

30. All reserve and produced water pits will be fenced. Reserve pits will be fenced on three sides during drilling operations. The fourth side will be fenced following release of the drilling rig. All fences will be constructed and maintained in accordance with design standards

appended to each permit by the Authorized Officer. All reserve and produced water pits will be dye-tested for leaking into streams when deemed necessary by the Authorized Officer.

31. All river, stream, and wash crossings required for access to project facilities will be at existing roads or bridges, except at locations designated by the Authorized Officer. Culverts or bridges will be installed at points where new permanent access roads cross live streams to allow fish unobstructed passage. Where temporary roads cross drainages or dirt fills, culverts will be installed during construction and removed upon completion of the project. Any construction activity in a perennial stream is prohibited unless specifically allowed by the Authorized Officer. All stream channels and washes will be returned to their natural state as quickly as possible. Such construction, when it would occur on National Forest Land, will be managed under the restrictions in the Forest Service and Department of Agriculture Policy Statement No. 2019, dated July 8, 1980. All construction for stream crossings will also follow the Stream Protection section of the Erosion Control, Revegetation, and Restoration Guidelines stipulation.

32. The riparian zone of stream crossings shall be rehabilitated immediately after construction is completed. Until riparian vegetation is established, the disturbed area shall be protected on each side of the stream to prevent sediment contamination of the stream and/or erosion of the banks.

33. A buffer strip of terrestrial vegetation will be left between staging areas and riparian vegetation adjacent to the stream. Riparian vegetation will not be counted upon as a buffer strip because silt collected by the riparian vegetation might enter the stream during high water periods.

34. Areas subject to mudflows, landslides, mudslides, avalanches, rock falls, and other types of mass movement will be avoided where practical when locating linear facilities. Where avoidance is not practical, the design, based upon detailed field investigations and analyses, will provide measures to prevent the occurrence of mass movements.

35. Watering or other approved dust abatement procedures will be done to prevent severe wind erosion and loss of soil materials during construction.

36. In compliance with the CU Plan, the Company will reclaim the surface of disturbed areas to conform with adjacent terrain by replacing fills in the original cuts, replacing soil material, water barring, and revegetating the surface.

37. In right-of-way or permit clearing in timbered areas, all tree stumps will be cut as low as practical, but not higher than 14 inches. The trees will be limbed and stacked adjacent to the right-of-way. During cleanup, all clearing and grubbing debris (slash), excluding stumps and useable products will be piled for burning or buried as specified by the Authorized Officer.

38. Preclearing of mountain brush and tree-covered areas prior to dozer and maintenance blade work will be required. Preclearing will involve hand cutting brush and trees and removing them to designated areas.

39. The clearing of timber, to reduce fire hazard, will be limited to the right-of-way.

40. Right-of-way clearing in timbered, dense shrub, and scenic areas shall be done in accordance with the approved clearing plan and shall be limited to a minimum width necessary to prevent interference of trees and other vegetation with the facility construction. Authorized Officer may require clearing to be "feathered or graded" with curved or undulating boundaries to lessen visual "tunnel" effect. In locations where the right-of-way enters timber, including dense shrub, from meadows or other open areas, the Authorized Officer may require clearing to be "feathered" into the timber in order to retain maximum natural vegetative patterns. Authorized Officer may require a landscape architect to assist in the design of the clearing plan. Right-of-way clearing in canyons spanned by power lines will be limited to that required to build the line and maintain clearance with the conductor. Trees and shrubs will be cleared by hand on fragile steep slopes and rock areas as identified by the Authorized Officer prior to construction. If any merchantable timber is involved in right-of-way clearing, it must be harvested in accordance with the terms of the BLM/FS timber sale contract.

41. A plan to minimize visual impacts from structures will be required as a part of the CU Plan. The holder will design the pipeline routes and ancillary structures to blend into the existing environment so as to meet the minimum degree of contrast acceptable for the Visual Resources Management Class and Visual Quality Objectives in which the structures would be located. The Authorized Officer will evaluate and approve measures before construction begins.

42. The Company shall paint all permanent structures (on site for a period longer than 90 days after construction) a flat, noncontrasting color that is harmonious with the adjacent landscape. Exceptions to this requirement would be determined on a case-by-case basis by the Authorized Officer because of varying levels of sensitivity, or structures which require safety coloration in accordance with Occupational Safety and Health Administration requirements. Prior to use, color selection will be approved by the Authorized Officer.

43. Prior to any surface disturbing activity, the Company, in consultation with the Authorized Officer and the Wyoming State Historic Preservation Officer, shall make an inventory of all archaeological and historical sites within these (rights-of-way, permits) areas if it has not previously been done. The Company shall develop a cultural resources plan to locate cultural resources which would be directly affected by the project through the use of a Class III field survey. The plan will define inventory extent and intensity of the site-specific surveys.

44. Any cultural resource (historic or prehistoric site or object) discovered by the Company or any person working on his behalf, shall be

immediately reported to the Authorized Officer. The Company shall suspend all operations in the area of such discovery until written authorization to proceed is issued by the Authroized Officer. An evaluation of the discovery will be made by the Authorized Officer and state to determine appropriate actions to prevent the loss of significant cultural values. The Company will be responsible for the cost of evaluations and for mitigation. Mitigation may include rerouting or excavation, and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the Holder.

45. The Company will provide an approved archaeologist to execute and monitor surveys and discoveries during construction of all project facilities.

46. The Company will provide a qualified paleontologist who would be approved by the Authorized Officer. The paleontologist will conduct an intensive survey of all areas to be disturbed according to the significance and mitigation needs. The paleontologist will be available, as needed, during surface disturbance. If the paleontologist determines that values will be disturbed, construction will be halted until appropriate action can be taken.

47. The Company will be required to control off-road vehicular use within these (rights-of-way, permits).

During construction, the Holder shall regulate access and vehicular traffic as required to protect the public, wildlife, and livestock from hazards associated with the project. The Holder shall permit free and unrestricted public access to and upon the right-of-way except in areas designated as restricted by the Holder. All restricted areas shall be approved in advance in writing by the Authorized Officer.

The Holder shall be allowed, with prior written approval from the Authorized Officer, to close the road to public access for limited periods during the construction phase of the project should it be necessary to do so to protect and insure public health and safety. At all other times, the Holder shall permit free and unrestricted public access to and upon the right-of-way.

48. Disturbance of improvements such as fences, roads, and watering facilities during the construction and maintenance of the rights-of-way must be kept to an absolute minimum. Immediate restoration of any damage to improvements to at least their former state will be required. Functional use of these improvements must be maintained at all times. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. A gate acceptable to the Authorized Officer shall be installed in the gate opening and kept closed when not in actual use. Where a permanent road is to be constructed or maintained, cattle guards shall be placed at all fence crossings.

49. If a natural barrier used for livestock control is broken during construction, the holder will adequately fence the area to prevent

drift of livestock. In pronghorn antelope ranges, the fence may have to be constructed in a manner which allows for animal passage. All fencing constructed by the Company will meet FS and BLM design requirements with input from Wyoming Game and Fish Department. Fence specifications will be determined on a case-by-case basis.

50. During construction the Company shall regulate access and vehicular traffic as required to protect the public, wildlife, and livestock from hazards associated with the project. The Company shall permit free and unrestricted public access to and upon the (right-of-way, permit) except in areas designated as restricted by the Holder or Authorizing Officer. All restricted areas shall be approved in writing by the Authorized Officer.

51. A transportation plan will be submitted as part of the CU Plan. This plan will cover approval of temporary, reconstructed, and newly constructed roads and will include clearing work, signing, rehabilitation, and uses associated with transportation needs. Overland access could be specified in lieu of road construction or reconstruction.

    Whenever practical "cross country" access will be utilized without clearing vegetation or grading a roadbed. All construction and vehicular traffic is to be confined to the right-of-way or designated access routes, roads, or trails unless otherwise authorized. All temporary work roads to be used for construction will be rehabilitated after construction in accordance with the approved rehabilitation plan. Only one road or access route will be permitted to each site requiring access. Any existing transportation or utility rights-of-way will be used wherever practicable to minimize adverse environmental impacts and the proliferation of separate rights-of-way.

52. Access roads necessary for operation and maintenance of the project will be clearly identified. Some of these access roads may be designated by the authorizing agency as closed for public use, including but not limited to, off-road vehicular travel.

53. The Company shall obtain necessary access permits from the county and Wyoming Highway Department for approach to a county, state, or U.S. highway prior to commencing any construction activity associated with the (grant, permit).

54. The Company shall be responsible for preventive and corrective road maintenance from the beginning to completion of operations under this (grant, permit). This may include, but not be limited to, blading roadway, cleaning ditches and drainage facilities, dust abatement, or other requirements as directed by the Authorized Officer.

B.6 ROADING GUIDELINES FOR GAS EXPLORATION AND DEVELOPMENT WITHIN THE RILEY RIDGE PROJECT AREA

APPLICABLE ROAD STANDARDS

The primary road access that an operator will be using will be either a county road or FS/BLM arterial, collector, or local road, or combination of these. In most cases, the actual work site will be some distance removed from the nearest road. The operator may gain access to the work site by locating, designing, and constructing a "temporary road" from a FS or BLM development road to the work site.

The existing FS/BLM and county roads are usually inadequate to facilitate the type and volume of traffic required for exploration and/or development of oil or gas reserves. Prior to use by an operator, the road must be upgraded at the operator's expense to the standard compatible with the proposed road use and FS and BLM classification.

FOREST AND BLM DEVELOPMENT ROADS

Arterials. For purposes of the Riley Ridge Project EIS well field, these are roads that service the entire well field or primary access to plant sites. A FS/BLM or other arterial shall be a double-lane, graded, drained, and surfaced road. The roadbed shall be crowned on tangents and superelevated on curves. The traveled way shall be between 20 and 24 feet in width, depending on the total anticipated traffic and environmental considerations on a site-specific basis. The minimum surface depth on all roads shall be 4 inches of crushed aggregate base or 6 inches of pit run gravel. The typical cross section for a double-lane road is as shown in the "typical sections." Culverts or bridges shall be installed at all minor stream crossings.

Collectors. For purposes of the EIS, these are roads that service several wells. A FS/BLM or other collector shall be either a 14-foot single-lane road with turnouts or a 20 to 24-foot double-lane road. The anticipated traffic volumes will be the basis for determination of the particular standard for a specific road. In many instances, the operator's proposed additional traffic will be sufficient to require upgrading the existing road to a higher standard. If the projected average daily traffic (public, commerical, administrative, operator) exceeds 100 vehicles per day, a double-lane facility will be required.

Locals. For purposes of the Riley Ridge Project EIS, these are roads that service one well. A FS or BLM road shall be a 14-foot wide single-lane road with intervisible turnouts.

Before construction, the FS or BLM (depending upon land status) will determine whether a local road will be obliterated and reclaimed at the completion of the exploration work, assuming a dry-hole is encountered, or whether it will be retained by the FS or BLM and added to the Forest Development Transportation System or the BLM District Transportation Plan. In the latter instance, the road will be constructed with turnouts. However, if it is not to be retained, it may be constructed without turnouts depending on the operator's proposed activities and FS or BLM recommendations as to management.

TEMPORARY ROADS

The term "temporary road" should not be interpreted to imply a lesser standard of construction. Policy is to require that road access to drill sites be properly located, designed, constructed, and maintained by the leasee and/or drilling operator. Such things as FS or BLM directional signs, bridge guard rails, and reduced numbers of turnouts (with appropriate management guidelines) can be designed. A temporary road will be obliterated, if the hole is dry, to requirements that will be described in the EIS/EA process.

PERIOD OF USE

The complexities of drilling in the Overthrust require that the design of roads accommodate all seasons of use unless the operator is willing to accept road closures due to weather. This means designing roads for all-weather access from frost heave to wet soils to dry conditions. The surfacing requirements on any road used by the operator will be dependent upon the type of soils on which the road is constructed. If snow removal will be required on graveled surfaces, additional thickness for anticipated loss must be included.

ROAD LOCATION

Access to work sites may require the construction of temporary roads and/or reconstruction of Forest Development Roads or BLM/county. Proper initial location of these roads will expedite approval of the operator's lease or permit. Some of the factors which must be considered during location are:

Environmental Considerations. Select wildlife habitat, riparian zones, unstable soil areas, threatened and endangered plant locations, side slopes over 40 percent, wetlands, archaeological sites, sensitive visual areas, and watershed areas should be avoided when possible during location studies.

Geotechnical Considerations. Unstable areas, potentially unstable areas, and areas showing evidence of high moisture or free water should be identified and avoided. Soil classification samples should be collected and processed during this period for future road surfacing determinations. Aggregate sources should be identified, tested, and mapped. Roadway excavation areas should be tested to determine the steepest stable cut slopes that could be constructed.

Geometric Considerations. The geometric standards for each particular road must be considered during location. The standards are shown in Table B-7a.

PRELIMINARY SURVEYS

The preliminary survey shall closely traverse along a line previously flagged by the operator and approved by the appropriate FS or BLM representative. Certain areas such as benches, wet areas, etc. may require exact conformance to flagged lines. Bisecting cross sections shall be taken at breaks in terrain, drainage areas, and at 100-foot intervals sufficiently wide to cover the entire clearing limits of the future road. Complete terrain cover, drainage systems, soil type, and land ownership shall be noted during the Preliminary Centerline Survey. A complete site survey shall be made at each major stream crossing. Any existing facilities, either operating or abandoned, crossed by the Preliminary Centerline shall be documented by station and orientation. Examples are powerlines, pipelines, roads, trails, fences, etc.

The class of survey required shall be defined by the BLM District Engineer and/or FS Engineer.

DESIGN

Roads shall be designed by or under the direct supervision of a Registered Professional Engineer. BLM may on a case-by-case situation, waiver this option "out on the flats". It will be followed where any ridges and side slopes are involved. All roads will be laid out at least by an experienced land surveyor on BLM lands.

General geometric design criteria are shown in Table B-7a.

Roads should be designed with the purpose of fitting the roadway to the terrain. This procedure will result in minimizing earthwork and disturbed area. The designer shall attempt to create a balanced earthwork project, thus avoiding the need for borrow areas and waste areas. Special care must be taken to compensate for the incremental grade on all switchbacks by holding a maximum centerline grade of four percent throughout the length of the switchbacks.

SLOPE SELECTION

The cut and fill slopes shown in Table B-7b, should be used as a guide only. The slopes shall be adjusted to uneven ratios in transition sections to prevent a zigzag appearance at the slope catch points. The top of cut or toe of fill line should be a smooth line with gentle curves. Slope ratios shall not exceed the maximum stable slope as determined by the geotechnical investigation. In areas where cut or fill will be the construction method, cross sections will be required in the plans.

TABLE B-7b

CUT AND FILL SELECTION TABLE

Height (ft.)	Slope Ratio
0-5	3:1 (minimum)-BLM may require 6:1 ratio or larger
5-20	2:1
Over 10	1½:1

PAVEMENT STRUCTURE

The type and amount (depth) of road surfacing shall be determined by the engineer through a procedure based on projected traffic loadings, bearing capacity of the subgrade soils, and the anticipated loss due to traffic use and maintenance. A further factor which is to be considered is the time period in which the operator will be using the road. Section Period of Use of this document defines the consideration which must be given this factor. The surfacing analysis shall be documented and shall become a part of the "road package" submitted to the FS or BLM for review and concurrence. If the minimum surfacing as stated under Forest and BLM Development Roads for arterials is used, documentation of this determination is not required.

An acceptable analysis may be as simple as comparing like soil types and structure depths (that are based on firm data from previous projects) to full laboratory analysis of subgrade materials using California Bearing Ratio (CBR) or R value tests. The level of analysis should be that necessary to assure the pavement structure depths will support the type of vehicle and volume of use anticipated. The depth of rock courses can be varied along the road to accommodate changes in subgrade bearing capacity.

TRAVELED WAY WIDTH

The width of the traveled way, i.e., the lane width plus shoulder width, is determined from Table B-7a. Accurate traffic projections combined with design speed or the facility are the determining factors for traveled way widths. The operator should establish the factors even prior to the time when road location efforts are undertaken, and review with and receive concurrence from the FS Engineer or BLM Authorized Officer prior to proceeding with the work. This information must be included in the road package when submitted to the FS or BLM (depending on land status) for review.

Curve widening shall be applied to the traveled way widths as required to accommodate the tracking characteristics of the design vehicle. The design vehicle shall be that vehicle commonly referred to as 3-3 or WB-50 as defined as AASHO.

CLEARING

Selective clearing may be required during earthwork to remove trees damaged by construction, particularly large trees at the top of cut slopes whose root systems protrude into the excavation zone. Care shall be exercised to prevent marring of trees by equipment. The Company will buy all timber on the road right-of-way.

All cleared material shall be disposed of through methods approved by the FS or BLM. Methods which may be approved are burning, burying outside the construction limits, decking of material for removal by the public for firewood, chipping, sale of merchantable timber to a mill, or other appropriate means, as suggested by the operator. The method to be utilized shall be identified in the construction plans and specifications.

DRAINAGE

Permanent drainage structures shall be installed to protect the road and adjacent watershed. Single lane roads shall have, as a minimum, armored drainage dips constructed in the roadbed to prevent water from channeling the road surface. Bridges, or occasionally culverts, shall be constructed in low flow drainages where stream and roadway geometrics permit. Culvert cross-drains shall be installed in all double-lane roads (drainage dips shall not be constructed on double-lane roads). They shall be located to accommodate natural drainage patterns and as ditch relief pipes. Culvert inlet basins will be required to install ditch relief pipes. The inlets shall have metal end sections and occasional elbows to provide proper installation. These pipes will extend to the toe of the fill slopes and erosion control devices or energy dissipators shall be utilized at the outlets.

Dips will be designed so that it will be apparent at the time the road is maintained that the dip is a permanent necessary feature of the road and is not an irregularity that can be smoothed out with a grader. Dips must be designed and not added as an afterthought. Slopes at the discharge point may need protection and should be greater than the slope of the road to prevent dips from filling with silt.

Where large natural drainage systems are encountered, a complete hydrological study of the system must be performed to predict the anticipated runoff.

As a minimum, culverts shall be designed for a 10-year flood (flow of 10-year recurrence interval) without a head at the entrance. They should also be designed to carry a 50-year flood without exceeding the allowable headwater. The allowable headwater is the maximum water elevation for which the resulting flood damages are considered to be acceptable. Major culverts (end area greater than 35 square feet) and minor bridges (spans on the order of 30 feet or less) should be designed for a 20-year flood and checked for a 50-year flood. All other bridges should be designed to pass a 50-year flood and checked for a 100-year flood.

The hydrological study shall be included in the road package upon submittal to the FS or BLM for review and concurrence. After the road design is approved, five copies of the plans will be prepared and given to the FS or BLM.

CONSTRUCTION

STAKING

Construction controls will be staked on the ground for all roads. Staking will be in accordance with standard practices and include a marked centerline, Points of Intersection, clearing limits, cut and fill stakes, drainage structures, and reference hubs. The degree of construction staking will be determined by the FS engineer or BLM Authorized Officer. Minimum staking should include a referenced centerline, staked culverts and dips, and the cut catch point on slopes over 40 percent. Construction staking shall be done as described in Forest Service Standard Specifications for Roads and Bridges. No work shall commence until Forest Service or BLM approval of construction staking is completed.

QUALITY CONTROL

The operator has the responsibility to ensure that each road is constructed according to plans and specifications approved by the FS or BLM. Forest Service Standard Specifications for the Construction of Roads and Bridges shall be utilized to establish and maintain construction standards. Copies are available from the Forest Supervisor's Office. The degree of construction control should complement the survey and design methods utilized. Lower standard surveys and designs may require more intensive construction engineering to assure an acceptable end product.

The FS or BLM will make periodic inspections to ensure that each road is properly constructed, at which time control tests and charts maintained by the operator shall be made available for review. This shall include density tests, aggregate gradations, photographs showing construction techniques, daily diaries, etc.

The normally accepted tolerances between the designed and constructed road are as shown in Forest Service Standard Specification 203.

Tolerances should be indicated on the project plans.

ROAD MAINTENANCE

The lessee's Operations Plan shall include a maintenance plan for all roads constructed or used by the lessee.

Users of Forest Development Roads shall pay their fair share of maintenance costs, and use of Forest Roads will be approved by FS road permits. This includes roads which lead to the area where additional access is needed. Lessees may either perform actual maintenance activities or pay cooperative deposits as the FS approves. Before a bond release is signed, all road damage caused by the user shall be repaired in a manner approved by the FS (this will not apply to BLM lands).

The maintenance plan should have definite provisions for preventing undercutting of cut banks and the unnecessary removal of established stabilizing vegetation on fill side of road (operators should be given special instructions).

OBLITERATION OF TEMPORARY ROADS

Upon abandonment and prior to when a bond release is signed, temporary roads shall be obliterated. All or part of the obliteration techniques that follow could be used depending on the EIS/EA direction. Obliteration shall commence by stripping the gravel course from the roadway surface by means of a scraper or by windrowing with a motor patrol and removal with a loader and trucks. The gravel may be stockpiled at approved sites. After stripping the ground, obliteration shall consist of rough grading, ripping or scarifying, cross ditching, and opening drainages to prevent erosion and encourage revegetation. The work shall not commence until after the temporary road is no longer needed to serve traffic.

After rough grading and ripping have been completed, the abandoned roadway shall be cross ditched.

Live streams and other drainages shall be opened by removing the abandoned structures and grading the approach fills so they will not impair the stream flow.

Abandoned structures shall be disposed of in agreed locations.

All obliterated areas shall be revegetated by applying seed and fertilizer mixtures as approved by the FS or BLM.

Roadways to be obliterated in high scenic quality areas will require more intensive procedures than those described above and may include such work as refilling cut slopes, removing fills, transplanting trees and shrubs, and other techniques deemed necessary to completely restore the area.

Culverts, bridges, construction signs, and other materials furnished by the operator will remain the property of the operator on obliterated roads.

B.7 EROSION CONTROL, REVEGETATION, AND RESTORATION GUIDELINES

Standard procedures for the Company will include implementation of erosion control and revegetation measures to assure that lands disturbed by construction and operation activities will be restored to a stable, productive, and aesthetically acceptable condition.

A detailed, site-specific reclamation plan will be developed and become part of the Construction and Use (CU) Plan submitted by each company under the requirements of the rights-of-way grants. Because the proposed rights-of-way are composed of many types of terrain, soils, vegetation, land uses, and climatic conditions, the detailed plan will include sets of techniques and measures tailored to each condition encountered. Preparation of the plans will use existing soils and geologic data and where determined necessary by the Authorized Officer, additional data will be collected. Local expertise and locally effective reclamation methods will be followed when the site-specific procedures for the detailed reclamation plan are developed. The CU Plan will approved by the Authorized Officer and implemented by the companies.

Detailed information regarding applicable techniques and technical assistance to private landowners concerning erosion control measures and reclamation procedures will be obtained from the Soil Conservation Service through local Soil Conservation Districts. Technical assistance and approval of written plans for federal lands would be obtained from the BLM and FS prior to any construction.

During construction, operation, and abandonment of the project, applicants will provide an experienced reclamation specialist for (1) liaison with private landowners, federal agencies, and local government; (2) direction for timely restoration requirements; and (3) favorable public relations.

General erosion control and restoration guidelines have been developed for the following areas and will be included as part of the CU Plan:

- Right-of-Way and Site Clearing.
- Site Preparation, Trenching, and Preservation of Topsoil.
- Backfilling and Grading.
- Land Preparation and Cultivation.
- Revegetation.
- Maintenance and Monitoring.
- Use of Chemicals.
- Construction Timing.
- Stream Protection.

RIGHT-OF-WAY AND SITE CLEARING

Emphasis will be placed on protecting existing vegetation and minimizing disturbance of the existing environment.

- Land grading will be done only on the area required for construction.

- Existing roads will be used for vehicle traffic where possible; vehicles and equipment will not be allowed in streambeds unless specified by the authorizing agency.

- Sidehill cuts will be kept to a minimum to ensure resource protection and a safe and stable plane for efficient equipment use. The authorizing agency will provide assistance and will approve sidehill cuts prior to construction.

- Existing ground cover such as grasses, leaves, roots, brush, and tree trimmings will be cleared and piled only to the extent necessary. Slash will be piled for later use in restoration operations or disposed of at the discretion of the authorized agency official.

- Trees and shrubs on the right-of-way that are not cleared will be protected from damage during construction.

- Where the right-of-way crosses streams and other water bodies, the banks will be stabilized to prevent erosion. Construction techniques will minimize damage to shorelines, recreational areas, and fish and wildlife habitat. A channel stability evaluation will be completed before stream crossing locations are finalized. Channel stability ratings of 3 or 4 shall be avoided (Forest Service 1978b).

- Care will be taken to avoid oil spills and other types of pollution in all areas, including streams and other water bodies and in their immediate drainages. All spills will be immediately cleaned up following notification of applicable State and Federal agencies.

- Design and construction of all temporary and permanent roads will be based on an approved transportation plan and will ensure proper drainage, minimize soil erosion, and preserve topsoil. After abandonment, these roads will be closed and areas restored without undue delay or maintained at the discretion of the landowners. Restoration, including redistribution of topsoil and establishment of natural surface drainage patterns, will be to the satisfaction of the landowner and/or authorizing official.

- During adverse weather conditions, as determined by the on-site reclamation specialist and federal agency officials, the authorizing agency will issue stop and start orders to prevent rutting or excessive tracking of soil and deterioration of vegetation in the right-of-way area.

- During construction activities in or near streams or lakes, sedimentation (detention) basins and/or straw bale filters will be constructed to prevent suspended sediments from reaching downstream water courses or lakes as required by the authorizing officer.

- If construction through extensive wetland areas is deemed necessary, construction will occur during the driest period of the year and/or erosion control mats will be used to minimize erosion damage to wetland sites, as required by the Authorizing Officer.

- Actual construction activities and implementation of erosion control measures will immediately follow clearing operations, especially in areas with soils that are highly susceptible to wind or water erosion and other special areas.

SITE PREPARATION, TRENCHING, AND PRESERVATION OF TOPSOIL

Site Preparation and trenching methods and techniques will ensure that:

- Topsoil is removed from the trench area, windrowed separately, protected, and replaced last during backfilling. This procedure and the depth of such topsoil removal will be specified by the Authorizing Officer.

- Topsoil will be removed from facility site areas (e.g., drill pads and roads) and stored for replacement on disturbed surface areas after final backfilling and grading.

- Remaining unearthed materials are removed and stored in a manner that facilitates backfilling procedures, uses a minimum amount of right-of-way area, and protects the excavated material from vehicular and equipment traffic.

- A specific trenching and excavated material stockpiling procedure will be used on steep-sloping and rough, broken terrain to ensure minimum disturbance as outlined in the CU Plan. This procedure will be developed by both the Authorized Officer and applicant.

BACKFILLING AND GRADING

The following backfilling and grading techniques will be used:

- Backfill will be replaced in a sequence and density similar to the preconstruction soil condition.
- Backfilling operations will be conducted in a manner that would minimize further disturbance of vegetation.
- The contour of the ground will be restored to permit normal surface drainage.
- In strongly sloping and steep terrain, erosion control structures such as water bars, diversion channels, and terraces will be constructed to divert water away from the pipeline trench and reduce soil erosion along the right-of-way and other adjoining areas disturbed during construction.
- All structures such as terraces, levees, underground drainage systems, irrigation pipelines and canals will be restored to preconstruction conditions.
- The surface will be graded to conform to the existing surface of the adjoining areas except for a slight crown over the trench to compensate for natural subsidence. In cropland areas, especially border and furrow irrigated cropland, the soils will be compacted and the crown will be smoothed to match the bordering area to allow surface irrigation.
- Topsoil will be uniformly replaced over the trench fill and other disturbed areas to restore productivity to its preconstruction condition.
- Materials unsuitable for backfilling or excess backfill material will be disposed of as arranged by the authorizing officials.
- Temporary work space areas used at stream and highway crossings and other special sites will be restored to approximate preconstruction conditions and to the satisfaction of the authorizing officials.
- The right-of-way at stream crossings will be restored to preconstruction conditions. The upland areas and banks will be revegetated to preconstruction conditions. Where this is not possible, they will be mulched with rock. The size of the rock mulch will be larger in diameter than materials excavated from the trench. The streambed will be returned to its original contours with sediments like those that were excavated.
- Well sites will be restored without undue delay and maintained at the discretion of the landowners. Restoration including grading and redistribution of topsoil, will be to the satisfaction of the landowner and/or Authorized Officer.

LAND PREPARATION FOR SEEDING AND CULTIVATION

Construction, backfilling, and grading activities commonly cause compaction and alter soil conditions that affect soil productivity and/or seeding success in the right-of-way area. The following practices and techniques will be used to improve these soil conditions, protect soil from erosion, and provide a favorable seedbed:

- In cropland areas, as required by the authorizing agency or landowner, subsoiling or chiseling will be used to ensure that soil compaction is reduced and preconstruction soil permeability is restored.
- Chiseling will be used, unless objected to by the landowner or authorizing agency, in rangeland areas to reduce compaction and improve soil permeability. Pitting and contour furrowing as directed by the authorizing agency or landowner will be done on steep slopes of disturbed areas to increase infiltration and to reduce runoff and erosion.
- Suitable mulches and other soil stabilizing practices will be used on all regraded and topsoiled areas to protect unvegetated soil from wind and water erosion and to improve water absorption.
- Special mulching practices or matting will be used, as necessary, in critical areas where wind and water are serious erosion hazards to protect seeding, seedlings after germination, and plantings.
- Commercial fertilizers will be applied to soil areas with low inherent fertility to maintain crop yields and establish grass seedings. Application rates will be commensurate with annual precipitation and available irrigation water.
- Seedbeds for areas seeded to grass will be prepared to provide a firm and friable condition suitable for the establishment of vegetation.
- Rock mulches will be used in steep-sloping rock outcrop areas and low precipitation areas to reduce erosion and promote vegetal growth.
- Cultivation and land preparation operations on steeply sloping areas will be done on the contour to minimize erosion.
- Soil area with rock fragments, such as very coarse gravel, cobble, or stone scattered on the surface, will be restored to the original preconstruction surface condition to blend with the adjoining area, to avoid a smooth surface right-of-way area, and to control accelerated erosion.

REVEGETATION (RESEEDING AND PLANTING)

The loss of vegetation from lands disturbed by pipeline construction can be mitigated only by satisfactory revegetation. To ensure a successful revegetation program, methods and procedures will be consistent with local climate and soil conditions and will consider recommendations and directions of local experts. Revegetation efforts will be continued until a satisfactory vegetative cover is established. The following practices and techniques will be used in areas where reseeding is suitable as determined by the authorizing agency:

- A firm seedbed will be prepared prior to seeding. This will include a mulch of plant residues or other suitable materials. A cover crop will be used as necessary in larger disturbed areas.
- Seed will be planted by drilling, broadcasting, or hydroseeding. Drilling is the preferred method because it is usually most successful. Drill seeding with a grass drill equipped with depth bands will be used where topography and soil conditions allow operation of equipment to meet the seeding requirements of the species being planted. Broadcast seeding will be used for inaccessible or small areas. Seed will be covered by raking or harrowing. Hydroseeding will be done in critical areas determined by the reclamation specialist or authorizing officer.
- Only species adaptable to local soil and climatic conditions will be used. Generally, these will be native species. However, introduced species may be considered for specific conditions when approved by the landowner and regulatory authority. Seeding rates in critical area plantings and generally throughout the right-of-way will be increased 100 percent over regular seeding rates to allow for seed mortality due to adverse growing conditions.
- Seed testing will be conducted to meet state, federal, and agency seed requirements.
- Seeding will be done when seasonal or weather conditions are most favorable, as determined by the landowner or authorizing officer.
- Grazing or mowing may be delayed at least one season after seeding to provide time for vegetation to become established, especially in highly erodible areas, unless objected to by the landowner or lessee. Protective fencing may be necessary in special areas and will be constructed, maintained, and removed according to authorizing agency specifications.
- In areas of low annual precipitation (generally less than 8 to 10 inches), where reseeding is not suitable or as successful, erosion control structures and measures will be applied on sloping areas

to reduce accelerated erosion, to allow re-establishment of preconstruction surface soil conditions, and to allow natural revegetation.

- Trees and shrubs will be reestablished in areas as specified in the revegetation plan. Temporary and/or permanent barriers to off-road vehicle access will be installed by the Company at specific locations along the right-of-way and other disturbed sites to prevent off-road vehicle access as specified by the authorizing agency.

MAINTENANCE AND MONITORING

Joint inspection of the right-of-way by the applicant and authorizing agency will be conducted to monitor the success and maintenance of erosion control measures and revegetation programs on disturbed land for two growing seasons, or for a period determined by the landowner on private land, or the authorized agency official on state or federal land. The monitoring program will identify problem areas and corrective measures to ensure vegetation cover and erosion control. Certification of successful revegetation and erosion control will be determined by the landowner or authorized agency official.

USE OF CHEMICALS

The use of biochemicals such as herbicides, fungicides, and fertilizers will comply with state and federal laws, regulations, and policies regarding the use of poisonous, hazardous, or persistent substances. State and federal wildlife agencies will be contacted if application of any of these substances will be on or near sensitive wildlife areas. Application of these substances will be by ground methods or by helicopter as approved by landowner and authorizing officer. Prior to the use of such substances on or near the permit or grant area, the applicant will obtain approval of a written plan for such use from the authorizing officer, landowner, and appropriate wildlife agency. The plan will outline the kind of chemical, method of application, purpose of application, and other information as required, and will be considered as the authorized procedure for all applications until revoked by the Authorized Officer, landowner, or appropriate wildlife agency. This plan will become part of the CU Plan.

CONSTRUCTION TIMING

Pipeline construction activities on irrigated hay or cropland will be timed, as possible, to avoid disruption of irrigation delivery systems during the major irrigation season to reduce effects on crop production in areas of construction as well as adjoining irrigated cropland areas served by the systems.

Pipeline construction activities in narrow floodplain areas subject to high erosion hazards would be timed to avoid high water flows as much as possible, this would reduce the effects of construction on erosion and sedimentation.

STREAM PROTECTION

To maintain stream bank stability, preserve the hydrologic characteristics of the existing stream channel and flood plain effectiveness, and minimize adverse changes in stream water chemistry, physical properties, or associated aquatic organisms, the following will be emphasized:

- The natural drainage channels of any stream will be maintained during construction activities wherever possible.
- Clear water diversion methods will be employed whenever construction activities such as pipeline trenching must pass through a stream channel.
- Tree or shrub vegetation, which give greater stability due to rooting structure, will be replaced during the revegetation of channel banks following construction.
- Construction staging and equipment service areas will be located outside of riparian areas.
- Following construction activities, the stream channel will be returned to as nearly the original width, depth, gradient, and curvature as possible.

SOCIOECONOMICS

S-1 Measure: Temporary worker camps will be required to house construction workers. Housing provided shall be consistent with Wyoming Industrial Siting Administration Permit conditions.

Effectiveness: Provision of construction work camps would help relieve the demand for single status housing throughout the project area. However, due to the presence of family status workers, these camps would not totally eliminate the significant housing impacts that would be associated with the project. Demand for single-family homes, multi-family units, and mobile home lots may still exceed the response capabilities of local area developers. Additional measures that would induce developers from outside the region to produce housing and/or the provision of other forms of temporary housing such as modular condominiums or apartments may be required to fully meet projected housing demand. The absence of sufficient numbers of housing units could otherwise result in an unquantifiable amount of temporary occupancy of area public lands ("squatting"), particularly in the vicinity of Big Piney, Marbleton, and LaBarge.

Application: This measure will be applied to the Proposed Action and all of the siting alternatives.

WILDLIFE AND FISHERIES

WF-1 Measure: State wildlife laws and regulations will be posted in conspicuous places at the job sites and work camps.

Effectiveness: Posting laws and regulations may help to reduce wildlife violation incidences or at least eliminate the violator's excuse of ignorance of wildlife laws.

Application: This measure will be applied to the Proposed Action and all alternatives.

WF-2 Measure: During construction and operation phases, dogs, excepting guard dogs or seeing-eye dogs, will be prohibited from well sites and construction sites.

Effectiveness: This measure would reduce harassment to wildlife species.

Application: This measure will be applied to the Proposed Action and all siting and component alternatives.

WF-3 Measure: The location of the well in the Graphite Unit, Sec. 22, T.27N., R.114W. will be relocated and approved by the Authorized Officer. Offset drilling or other measures may be required at the time of approval.

Effectiveness: Relocating this well to the northeast would reduce critical winter range losses and associated human disturbances to elk wintering in the Graphite Hollow area, and would slightly decrease predicted elk population reductions and productivity losses.

Application: This measure will be applied to the Proposed Action and all alternatives.

WF-4 Measure: Construction of any pipelines in the Seedskadee National Wildlife Refuge would be in accordance with any seasonal and other restrictions determined by the Fish and Wildlife Service.

Effectiveness: Implementation of this measure would decrease human disturbance impacts to sensitive species.

Application: This measure will be applied to the Shute Creek Alternative sales gas and CO_2 line which Exxon has identified.

WF-5 Measure: Where the Authorized Officer determines that rehabilitation of temporarily disturbed areas within critical wildlife habitat on federal land will not be successful within five years from disturbance, the company will be required to compensate for the lost habitat. Temporarily disturbed areas do not include those covered by permanent facilities like road beds, well site equipment, etc. Such critical wildlife habitat will be determined by the Authorized Officer in conjunction with Wyoming Game and Fish. Compensation will include continued rehabilitation efforts on the disturbed areas and development and implementation of an off-site mitigation plan for similar critical habitat on federal land within the species use area that is in poor condition due to natural or man-made causes. The plan must be approved by the Authorized Officer who will coordinate with Wyoming Game and Fish.

Effectiveness: Implementation of this measure will have only limited effectiveness in mitigating impacts to wildlife critical range. "Successful rehabilitation within five years," as used above applies primarily to soils and vegetation criteria for defining success in rehabilitation. Big game critical ranges are generally dependent upon shrub habitats which provide forage during critical winter periods when grasses and forbs are covered by snow. Successful rehabilitation of critical range to shrub habitats would take from 10 to 50 years depending upon shrub species, soils, moisture, and a variety of other factors. Rehabilitation of disturbed areas to soils and vegetation success standards is a necessary first step in successful reestablishment of critical ranges.

Secondarily, even when critical range shrub habitats are reestablished along road and well pad edges, their value to wildlife will be limited due to wildlife's behavioral reaction to continued human activity.

In addition, the mitigation measure specifies off-site mitigation for similar critical range "within the species use area". This terminology would unnecessarily limit the measure's effectiveness by not specifying mitigation possibilities for other species.

Application: This measure will be applied to the Proposed Action and all siting and component alternatives.

WF-6 Measure: Northwest Pipelines wastewater evaporation pond at their Craven Creek treatment facility will require the installation of special wildlife protective measures. These measures include sufficient deterents to keep terrestrial animals, waterfowl, and birds out of the pit. The design of deterent methods and the development of an implementation and monitoring plan shall be included as part of Northwest's Construction and Use (CU) plan for the treatment plant facility. Review of this plan will include the U.S. Fish and Wildlife Service (FWS) and the Wyoming Game and Fish Department (WG&F). Approval by the Authorized Officer of the CU Plan is required prior to construction.

Methods of deterrence may include fencing the evaporation pond with small mesh wire to protect terrestrial wildlife; stringing beaded cables which are studded with plastic "whirlers" or other mechanical devices which would frighten birds; placing the pond near human activity or stationing a person to frighten birds away during migration; or other methodologies which must be approved by the Authorized Officer.

Effectiveness: Implementation of this measure would preclude small animals and big game using the pond as a drinking water source and being harmed or killed by ingesting the toxic wastewater.

This measure would mitigate the potential for impacts to waterfowl, shorebirds, or other migratory birds which may be attracted to the evaporation pond. Any migratory bird mortality associated with the evaporation pond would be an illegal action under Section 2 of the Migratory Bird Treaty Act (16 U.S.C. 703-711). This measure would ensure compliance with said Act.

Application: This measure will be applied to the Proposed Action and all alternatives.

WF-7 Measure: Colored markers will be hung on transmission lines to increase visibility of wires over river crossings within known bald eagle concentration areas in order to reduce eagle and sandhill/whooping crane collisions with wires.

Effectiveness: As written, this measure would reduce the potential for eagles, whooping cranes, sandhill cranes, and waterfowl striking wires where they cross the river. This measure would not be effective in reducing potential wire-strikes in the other sensitive areas of Fontenelle Creeek and LaBarge Creek.

Application: This measure will be applied to the Buckhorn, Shute Creek, and Northern Alternatives.

WF-8 Measure: The critical ranges and other important wildlife areas will be avoided during the periods listed below during construction of linear facilities unless direction is otherwise given from the Authorized Officer. (See Wildlife Technical Report wildlife maps for location of specific areas.)

Area	Period
Elk critical winter range	Nov. 15 to April 1
Elk calving areas	May 15 to June 30
Deer critical winter range	Nov. 15 to April 1
Sage grouse leks	March 1 to June 30
Golden eagle nests (within ½ mile)	February 1 to July 15
Osprey nests (within ½ mile)	April 15 to August 15
Prairie falcon nests (within ½ mile)	March 15 to August 1
Merlin nests (within ½ mile)	April 15 to August 15
Ferruginous hawk nests (within 1 mile)	March 15 to July 15
Cooper's hawk nests (within ½ mile)	April 1 to August 15
Burrowing owl nests (within ½ mile)	April 15 to July 15
Swainson's hawk nests (within ½ mile)	April 1 to July 15
Cutthroat-Rainbow Trout (stream Crossings)	April 15 to July 10
Brown & Brook Trout (Stream Crossings)	Sept. 1 to Nov. 1

Effectiveness: Avoiding the areas listed above would eliminate many of the potential impacts to species of concern.

Application: This measure will be applied to the Proposed Action and all alternatives.

WF-9 Measure: Staging areas for stream crossing equipment will be located outside of the stream's riparian zone in order to reduce the possibility of silt entering into streams and to reduce disturbance to vegetation in the riparian zone. A maximum construction right-of-way of 25 feet would be used in riparian areas to reduce disturbance. Variances to this must be approved by the Authorized Officer.

Effectiveness: This measure will reduce the total amount of riparian vegetation removed during construction, minimizing loss of stream bank cover, eroded material available to the stream, and habitat degradation from suspended solids and turbidity.

Application: This measure will be applied to the Proposed Action and all alternatives.

WF-10 Measure: Well pads and all other facilities, currently and in the future, planned for the riparian zone shall be offset from the stream bank and/or out of alluvial soils or soils with poor drainage as approved by the Authorized Officer. The distance should be at least 500 feet wherever topographically possible.

Effectiveness: This measure will minimize loss of stream bank cover and reduce sediment available to streams. It will also reduce the potential for accidental spills of toxic substances reaching the stream and may also reduce the potential for contamination of surface water resulting from leaks in casing.

Application: This measure will be applied to the Proposed Action and all alternatives.

WF-11 Measure: Crossings of the Green River will be conducted during the fall low flow period.

Effectiveness: Crossing the Green River at low flow will minimize habitat degradation by minimizing the amount of suspended solids and turbidity generated during in-stream construction.

Application: This measure will be applied to the Proposed Action, Exxon and American Quasar CO_2 and sales gas pipelines; Buckhorn Alternative, American Quasar, and Williams sour gas pipelines, molten sulfur pipeline, Exxon sales gas and CO_2 pipelines; Shute Creek Alternative, American Quasar sour gas pipeline, molten sulfur pipeline, Exxon sales gas and CO_2 pipelines; Northern Alternative, American Quasar molten sulfur pipeline, sour gas pipeline, Exxon sales gas and CO_2 pipelines.

WF-12 Measure: The intake structure on the Green River for the proposed Craven Creek water supply pipeline (and any others) will be constructed in accordance with design specifications provided or approved by Wyoming Game and Fish.

Effectiveness: Having design specifications for the intake structure approved by Wyoming Game and Fish should eliminate any significant adverse impacts to fisheries associated with impingement, entrainment, reduced flows, or habitat loss.

Application: This measure will be applied to the water supply pipeline for the Craven Creek site, and all alternatives with the Craven Creek plant site.

WF-13 Measure: The companies will be required to implement the fisheries and surface water quality monitoring program appended to the FEIS. Stream sampling locations will include the four established stations in the well field on Fish Creek, Beaver Creek, Pine Grove Creek, and Black Canyon Creek as well as others that may be specified by the Authorized Officer.

Effectiveness: The sediment monitoring program will help identify and quantify adverse impacts in the wellfield but it will not eliminate any impacts related to sedimentation, unless it results in additional corrective action (special erosion control) in severely affected streams.

Application: This measure will be applied to the Proposed Action and all alternatives.

WF-14 Measure: In the event an applicant finds it necessary to remove a beaver pond which has flooded an existing road, the applicant will initiate consultation with WGF and BLM or the FS.

Effectiveness: If alternative measures can be found to eliminate the beaver pond, loss of critical fisheries habitat will be minimized.

Application: This measure will be applied to the Proposed Action and all alternatives.

HEALTH AND SAFETY

H-1 Measure: Companies will be required to provide automatic shut down systems on sour gas trunk lines for all block valves.

Effectiveness: Automatic operation of block valves was assumed in the modeling conducted for H_2S releases from trunk line ruptures. Automatic block valves are effective in limiting the amount of sour gas released during a pipeline rupture.

Application: This measure will be applied to the Proposed Action and all alternatives.

H-2 Measure: Companies will be required to have automatic shut down systems for all sour gas wells within the Riley Ridge well field.

Effectiveness: This measure will reduce the amount of sour gas released in the event of a gathering pipeline leak or rupture and will allow a well to be shut-in without exposing people to potentially high levels of H_2S.

Application: This measure will be applied to the Proposed Action and all alternatives.

H-3 Measure: Companies will develop community contingency and evacuation plans in coordination with the public safety organizations including community civil defense organizations, sheriff, highway patrol, fire departments, livestock operators residing in the area, and other human inhabitants, etc., for accidental release of H_2S and in accordance with appropriate federal and state regulations. Plans will include early warning and mass alert systems, and human evacuation procedure. Communities involved will be Marbleton, Big Piney, Western Camp, Dry Piney Camp, Calpet, and LaBarge. Outlying areas include all other permanent residences within the project area or area of influence, and temporary human occupancy areas (i.e., Fontenelle Recreation Area).

Effectiveness: Community and outlying area contingency and evacuation measures would be an effective means of insuring that an organized, systematic approach towards alerting and evacuating the populations of the communities and outlying residence occurs. The contingency and evacuation plans will address possible H_2S hazards and describe the procedure that will be used to protect human life. These plans would include concern for any receptor within the area of influence of the well field, trunk lines, or processing plants. The measure, however, would not eliminate the possiblity of some people being exposed to significant or lethal levels of H_2S.

Application: This measure will be applied to the Proposed Action and all alternatives.

H-4 Measure: No sour gas trunk line will be located closer than 1 mile to a populated area or sensitive receptor as identified on Map 2-1 in the FEIS. The applicants must use the best available engineering design (i.e., alignment, block valve type and spacing, pipe grade, etc.), best construction techniques (i.e., pipe depth, hydrostatic testing, etc.), and monitoring plans (i.e., surveillance, warning signs, etc.) as approved by the Authorized Officer to minimize both the probability of rupture and radius of exposure in the event of an accidental pipeline release of sour gas. A variance from the 1-mile distance may be granted by the Authorized Officer based on detailed site-specific analysis that would consider meteorology, topography, and special pipeline design and/or construction measures. This analysis would ensure that populated areas and sensitive receptors would not be exposed to an increased level of risk.

Effectiveness: This measure will reduce both the probability of a rupture and minimize the extent of exposure for both discomfort and lethal levels of H_2S to sensitive receptors in the event of a sour gas pipeline rupture. The probability of rupture can be reduced by such measures as warning signs, burial depth, pipe thickness and grade, while such measures as block valve types and spacing and pipeline alighment would minimize the exposure radius from the point of rupture in the event of an accident. See Attachment B.9 for a discussion of the effectiveness of block valve spacing and resultant exposure distances.

Application: This measure would be applied to the sour gas trunk lines in the Proposed Action and all alternatives, specifically Northwest Pipeline's 30-inch diameter line, American Quasar's 30 and 36-inch diameter lines, and Exxon's 30-inch line for the Shute Creek Alternative.

H-5 Measure: Drilling operators will be required to identify in their H_2S contingency plans readily available sources of fuel gas in the area during drilling operations. This gas could be added at the flare stack to burn the H_2S in the event of an uncontrolled blowout.

Effectiveness: This measure would reduce the risk of exposure to both discomfort and lethal levels of H_2S in the event of a blowout. The flaring would convert the H_2S to less harmful SO_2.

Application: This measure will be applied to the Proposed Action and all alternatives.

H-6 Measure: All applicants will be required to have a gas-assisted flare mechanism at the plant site to flare the non-combustible sour gas in the event of a plant upset.

Effectiveness: In the event of a total plant shutdown, gas must be flared for an interim period until the wells can be shut-in. Since the raw sour gas is not combustible, a gas-assisted flare will be necessary. This would minimize the impacts to nearby sensitive receptors.

Application: This measure would be applicable to all applicants at all siting locations.

WATER RESOURCES

W-1 Measure: Because of the data gaps in the EIS on composition of water to be injected, injection procedures, and surface and bottom locations, all injection wells on federal lands to be used for plant waste water are not covered in sufficient detail by this EIS. Consequently, all injection wells for plant waste water disposal on federal lands, including those on plant rights-of-way, will need an EA or other NEPA compliance prior to approval. This may be facilitated by the applicant for Wyoming DEQ permits also submitting that information to the BLM for analysis.

Effectiveness: The drilling of all injection wells in compliance with State of Wyoming requirements will help minimize the degradation of aquifers.

Application: This measure will be applied to the Proposed Action and all alternatives.

W-2 Measure: All injection wells must be designed in accordance with the Wyoming DEQ and the Wyoming Oil and Gas Commission. In addition, those on Federal minerals must have the approval of the BLM Minerals Division.

Effectiveness: Cementation of the annular space surrounding the well casing would greatly reduce the possibility of contaminating aquifers penetrated by the well. Poor quality waters from saline aquifers, or leaked from poorly constructed or corroded casing would be prevented from migrating vertically along this annular space to aquifers which contain good quality water.

Application: This measure will be applied to the Proposed Action and all alternatives.

AIR QUALITY

AQ-1 Measure: The companies will be required to fund, at least in part, a long-term acid deposition monitoring and analysis program to track potential impacts to Class I areas within the region. The most likely areas to be monitored are the Bridger and Fitzpatrick Wildernesses within the Wind River Range. Based on the Air Quality Technical Report prepared by ERT for the Riley Ridge EIS, the Forest Service will develop a program which will be at least partially funded by the Companies at a level to be determined by the Forest Service. Such a level will be determined, among other considerations, by the actual number and placement of plants. Participation by a particular company would be contingent upon its receiving a plant right-of-way grant and the timing of its activities with that grant.

Effectiveness: Baseline and post construction data in the Bridger and Fitzpatrick Wildernesses relating to the short- and long-term effects on water quality, soils, flora, and fauna will provide valuable information for documenting existing conditions, the effects, and determining which environmental parameters are principally involved in acid deposition. Conceptual monitoring recommendations are delineated in Appendix E.

Application: This measure will be applied to the Proposed Action and all alternatives.

AQ-2 Measure: In order to comply with the requirements of a PSD Permit, American Quasar would be required to implement technology for control of H_2S and SO_2 emissions at the East Dry Basin plant site and for control of H_2S at the Buckhorn plant site. One technique for H_2S and SO_2 control would employ a system to feed the sweetened gas to a catalytic hydrolysis reactor where residual COS would be converted to H_2S following acid gas removal. The H_2S would then be removed in a trim H_2S contactor using lean selexol solvent. Prior to committing to a particular control technology, American Quasar would have to evaluate this system along with other processes to determine the additional SO_2 control generated by this technology.

Effectiveness: A minimum sulfur removal of 99.72 percent is required in order to comply with PSD increments at East Dry Basin. While BLM does not regulate compliance with air quality regulations and cannot require specific control technology, compliance with PSD Permit requirements will be necessary for issuance of a BLM right-of-way grant. While the control level is technologically feasible, cost considerations may prevent certain technologies from being implemented.

Application: This measure will be applied to the Proposed Action for SO_2 control and the Proposed Action and all alternatives for H_2S control.

SOILS AND VEGETATION

SV-1 Measure: All new well field pipelines and transmission lines will be required to use common rights-of-way when economically and technically feasible. The exact locations will be determined as necessary by the Authorized Officer.

Effectiveness: Although this measure will not eliminate loss of vegetation for new facilities, it will concentrate development to designated areas limiting impacts on land use and wildlife. Maintenance and erosion control will probably be accomplished more easily with corridors confined to the same vicinity; it may also eliminate excessive cut and fill for new roads.

Application: This measure will be applied to the Proposed Action and all alternatives.

SV-2 Measure: Development will avoid or minimize disturbance to highly saline-alkaline sites and sand dunes. An example of a saline-alkaline site is the "white alkali" Soapholes area north and east of Big Piney. Locations to be avoided would be determined by the Authorized Officer.

Effectiveness: Avoiding and minimizing disturbance to sand dunes and alkali areas will eliminate problems in revegetating saline soils and stabilizing eroding dunes.

Application: This measure will be applied to the Proposed Action and all alternatives.

SV-3 Measure: During transmission line construction, brush (shrub) clearing along access trails and at tower assembly areas will be limited to trimming and/or crushing to avoid disturbing root systems.

Effectiveness: This measure will be effective in limiting the amount of shrub vegetation disturbed along the transmission line right-of-way. By not disturbing the root system, some crushed or clipped shrubs will resprout and revegetate the right-of-way more quickly. This will reduce soil erosion and speed restoration of wildlife habitat.

Application: This measure will be applied to the Proposed Action and all alternatives.

SV-4 Measure: All areas not needed for production on the well pads must be recontoured and rehabilitated following the drilling phase for each well. The determination on necessary area for operation will be made by the Authorized Officer in consultation with the operator.

Effectiveness: This measure will be effective in revegetating the well pad area and will reduce soil erosion as well as speed restoration.

Application: This measure will apply to the Proposed Action and all alternatives (applicable to Williams well pads only).

VISUAL RESOURCES

V-1 Measure: The following gathering pipeline segment will be relocated off the steep forested slopes: the pipeline from the well in Section 13, T.29N., R.115W., will be rerouted to follow the road to the proposed well in Section 18 T.29N., R.114W.

Effectiveness: Relocation of the pipeline would eliminate the most visually prominent pipeline cuts, and have a noticeable effect on reducing the combined visual change as seen from South Piney Creek Road and Snider Basin.

Application: This measure will be applied to the Proposed Action and all alternatives.

V-2 Measure: In forested areas, pipelines will cross existing roads in a configuration that provides visibility of only short segments of the corridor by making a jog soon before and after crossing. Deviations or exceptions based on slope or other technical problems must be approved by the Authorized Officer.

Effectiveness: This measure would reduce the extent of visibility of project facilities adjacent to sensitive viewpoints.

Application: This measure will be applied to the Proposed Action and all alternatives.

V-3 Measure: Where possible, power distribution lines in the well fields will be placed underground and located in the pipeline or road rights-of-way within ½ mile of sensitive viewpoints, including: Middle Piney Creek Road, South Piney Creek Road (including Snider Basin), Indian Creek/Coal Creek Road, Pine Grove Ridge Road and upper Beaver Dam Creek Road (in Section 3, 4, and 5, R.114W., T.27N.). Others may be determined by the Authorized Officer.

Effectiveness: This measure would reduce the negative influence created by a scattered maze of wood poles and electrical lines, such as now exists in portions of the well field presently under development. Undergrounding would have a significant effects in reducing the cumulative adverse visual change that would otherwise occur.

Application: This measure will be applied to the Proposed Action and all alternatives.

V-4 Measure: Wires, conductors, insulators, and towers of transmission lines will have a dull finish to reduce reflection and visibility of the structures. If the authorized officer determines that certain distribution lines should use nonreflective materials, then it may be required.

Effectiveness: This measure would reduce the visual contrast of proposed structures, particularly as seen from middleground and background viewing areas.

Application: This measure will be applied to the Proposed Action and all alternatives.

V-5 Measure: Where directed by the Authorized Officer within the analyzed mile-wide corridors, transmission lines located along valley floors will be situated such that the structures follow the landform break or vegetative change between the valley floor and sideslopes to reduce the visibility of the structures.

Effectiveness: Such an alignment would make the lines less prominent and therefore, reduce both the facility and combined visual change impacts.

Application: This measure will be applied to the Proposed Action and all alternatives.

V-6 Measure: The UP&L transmission line segment running from the proposed Big Mesa plant site to the proposed substation will be relocated off the prominent ridge top location. It will run northeast from the proposed Big Mesa plant site to the Dry Piney Creek Road and follow the road to the substation site.

Effectiveness: Removing the line from this extensive and prominent landscape feature would greatly reduce the visibility of the transmission line. Facility impacts would be reduced to insignificant, and the combined visual change impacts in this area would also be diminished.

Application: This measure will be applied to the UP&L transmission alternative.

V-7 Measure: The companies will be required to remove litter including broken equipment, work trash, and other man-produced material, from well field units, plant sites, and other areas of operation. Litter will be disposed of in approved sites.

Effectiveness: This measure will minimize adverse visual impacts from litter in the Project area.

Application: This measure will be applied to the Proposed Action and all alternatives.

AGRICULTURE/GRAZING

AG-1 Measure: Construction will be scheduled during the months of April, May, and October to avoid conflicts with trailing sheep herds on the Slate Creek Sheep Trail. Timing will be determined by the Authorized Officer.

Effectiveness: This measure will reduce harassment to livestock and reduce the potential for livestock loss.

Application: This measure would be applied to the construction of all pipeline and transmission lines that would cross the Slate Creek Sheep Trail. These will include the following:

Proposed Action - Northwest's sour gas pipeline and plant water pipeline; Exxon's sulfur pipeline; and Exxon's and Quasar's transmission line.

Buckhorn - Same as Proposed Action.

Shute Creek - Northwest's sour gas pipeline and plant water pipeline; Exxon's sour gas pipeline, sulfur pipeline; and plant access road; and Exxon and Quasar's transmission line.

Northern - Exxon's sulfur pipeline and all companies' transmission line.

TRANSPORTATION

T-1 Measure: The companies will schedule their own and their contractors' large truck activities to avoid the following high recreation demand weekends. This will normally cover three-day periods.

- Memorial Day
- Independence Day
- Pioneer Day (July 24)
- Labor Day
- First two weekends of big game season

Effectiveness: This measure would eliminate the potential conflict between project vehicle activity and peak daily recreation travel demand associated with the high activity holiday weekends.

Application: This measure will be applied to the Proposed Action and all alternatives.

T-2 Measure: In spring and fall months when road moisture content is high, as determined by the Authorized Officer, the companies and their contractors will limit large truck activity in the well field to periods of frozen road conditions to protect the road beds.

Effectiveness: This measure will help preserve the stability of road beds and maintenance of travel surfaces.

Application: This measure will be applied to the Proposed Action and all alternatives.

T-3 Measure: The companies and their contractors will use front and rear vehicle escorts in the well field for oversized, overweight loads to maximize safety, as determined by the Authorized Officer.

Effectiveness: This procedure will help maximize the operational safety of equipment transport in the well field.

Application: This measure will be applied to the Proposed Action and all alternatives.

T-4 Measure: On federally permitted roads, stop signs and advance warning signs will be installed in areas of intersecting traffic, construction, or conditions of dangerous operation.

Effectiveness: The traffic control and informational signing will help minimize the potential for accidents at intersecting roadways.

Application: This measure will be applied to the Proposed Action and all alternatives.

LAND USE PLANS, CONTROLS, AND CONSTRAINTS

L-1 Measure: The railroad sulfur transport system will be located outside of the Seedskadee National Wildlife Refuge.

Effectiveness: Relocation of the proposed railroad would eliminate the impacts to riparian habitat within the Seedskadee National Wildlife Refuge and eliminate the conflicts with the habitat enhancement objectives of the Refuge.

Application: This measure will be applied to the Railroad Sulfur Transport Alternative for Exxon and American Quasar.

L-2 Measure: As determined by the Authorized Officer, the following will be required: the sulfur pipeline will be located along or as near as possible to existing roads or trails. Following construction, the right-of-way will be reclaimed in accordance with the Erosion Control, Revegetation, and Restoration Guidelines (Appendix B.7). Operation of the pipeline includes: 1) Monitoring--which will be limited to fixed-wing and helicopter patrol, vehicle via existing roads and foot patrol; and 2) Maintenance--which will be limited to four-wheel drive vehicle during summer and snow equipment during during periods of snow via closest existing road to pipeline segment needing maintenance. In the event required maintenance occurs during wet periods, causing soil/ vegetation disturbance, reclamation of such areas will be required as soon as weather and seasonal conditions permit.

Effectiveness: Locating the sulfur pipeline along or as near as possible to existing roads or trails will greatly reduce and eliminate potential impacts to soils and vegetation. Monitoring and maintenance access requirements will also help eliminate associated potential soil, erosion, and vegetation impacts.

Application: This measure will be applied to the Proposed Action and all alternatives.

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B.9 SOUR GAS TRUNK LINE MITIGATION MEASURES

One measure available to mitigate H_2S impacts from trunk line ruptures would be the use of block valves to seal off a segment of ruptured pipeline. Block valves react to changes in pipeline pressure and close in a period ranging from a few seconds to a few minutes, depending on pipeline diameter. A quantitative risk assessment was conducted using the trunk line block valve spacings as specified by the applicants, as well as additional block valve spacing along trunk line segments near populated areas. The results are presented below.

PROPOSED ACTION WITH ADDITIONAL BLOCK VALVES

For the Proposed Action, the Quasar trunk line was modeled with 10-mile block valve spacing (as proposed) away from the designated populated areas. In addition, 2-mile block valve spacing near population areas was investigated to explore possible mitigation measures. Northwest's trunk line was modeled, as proposed, with 5-mile block valve spacing away from the population areas, and 2.5-mile block valve spacing near the population areas. In addition, 1-mile block valve spacing near populated areas was investigated to explore possible mitigation measures. Northwest's trunk line was modeled with shorter block valve spacings because the gas has a higher average H_2S content than is expected to occur in Quasar's gas field.

The modeling analysis was carried out as described in the Health & Safety Technical Report, and a corresponding risk assessment was performed for the Proposed Action with mitigation by additional block valves. The population areas considered were LaBarge, Big Piney/Marbleton, Calpet, and the Fontenelle Recreation Area. The results are shown in Table B.9-1. It was found that only Calpet would be at risk of exposure to lethal levels from a trunk line rupture, and that the use of additional block valves reduces the annual risk of lethal exposure by about 25 percent (from 0.00023 to 0.00018). The annual risk of discomfort exposure is reduced even more, about 33 percent (from 0.00037 to 0.00025). With this additional block

TABLE B.9-1

ANNUAL RISK TO POPULATED AREAS FROM PROPOSED ACTION WITH ADDITIONAL BLOCK VALVES

Populated Area	Individual Risk of Lethal Exposure[1]	Individual Annual Risk of Significant Impact[2]	Approximate Number of People (1990)[3]
LaBarge	negligible[4]	negligible	1,206
Big Piney	negligible	negligible	1,177
Marbleton	negligible	negligible	1,134
Calpet	0.00018	0.00025	54
Fontenelle Recreation Area	negligible	negligible	1,210

[1] Risk values shown in this table, such as 0.00025, mean 25 chances per 100,000.

[2] Significant exposures are those that would cause eye irritation, coughing, loss of smell, or other discomfort.

[3] Includes people in incorporated and unincorporated area.

[4] Neglible means that the modeling analysis indicates no risk.

valve spacing near the populated areas of LaBarge, Big Piney/Marbleton, and the Fontenelle Recreation Area, the annual risk of discomfort exposure declines to negligible.

BUCKHORN ALTERNATIVE WITH ADDITIONAL BLOCK VALVES

For the Buckhorn Alternative, the Quasar trunk line was modeled with 10-mile block valve spacing (as proposed) away from the designated populated areas. In addition, 2-mile block valve spacing near the population areas was investigated to explore possible mitigation measures. Northwest's trunk line was modeled with 5-mile valve spacing (as proposed) away from the population areas and 2.5-mile near populated areas. In addition, 1-mile block valve spacing near the population areas was investigated as a possible mitigation measure.

The modeling analyses were carried out and a corresponding risk assessment was performed for the Buckhorn Alternative, with mitigation by additional block valves. The results, shown in Table B.9-2, are identical to those described above for the Proposed Action with additional block valves.

SHUTE CREEK ALTERNATIVE WITH ADDITIONAL BLOCK VALVES

For the Shute Creek Alternative, the Quasar and Exxon trunk lines were modeled with 10-mile block valve spacing (as proposed) away from the designated populated areas. As before, additional 2-mile block valve spacing near the population areas was explored as a possible mitigation measure. Northwest's trunk line was modeled with 5-mile block valve spacing (as proposed) away from the population areas, 2.5-mile near populated areas, and also as before, with additional 1-mile block valve spacing near the population areas.

The modeling analyses were carried out and a corresponding risk assessment was performed for the Shute Creek Alternative with mitigation by additional block valves. The results are shown in Table B.9-3. It was found that only Calpet would be at risk of exposure to lethal levels from a trunk line rupture. The annual risk of lethal exposure at LaBarge declines to negligible. The use of additional block valves reduces the annual risk of

TABLE B.9-2

ANNUAL RISK TO POPULATED AREAS FROM BUCKHORN ALTERNATIVE WITH ADDITIONAL BLOCK VALVES

Populated Area	Individual Risk of Lethal Exposure[1]	Individual Annual Risk of Significant Impact[2]	Approximate Number of People (1990)[3]
LaBarge	negligible[4]	negligible	1,206
Big Piney	negligible	negligible	1,177
Marbleton	negligible	negligible	1,134
Calpet	0.00018	0.00025	54
Fontenelle Recreation Area	negligible	negligible	1,210

[1] Risk values shown in this table, such as 0.00025, mean 25 chances per 100,000.

[2] Significant exposures are those that would cause eye irritation, coughing, loss of smell, or other discomfort.

[3] Includes people in incorporated and unincorporated area.

[4] Neglible means that the modeling analysis indicates no risk.

TABLE B.9-3

ANNUAL RISK TO POPULATED AREAS FROM SHUTE CREEK ALTERNATIVE WITH ADDITIONAL BLOCK VALVES

Populated Area	Individual Risk of Lethal Exposure[1]	Individual Annual Risk of Significant Impact[2]	Approximate Number of People (1990)[3]
LaBarge	negligible[4]	0.000068	864
Big Piney	negligible	negligible	861
Marbleton	negligible	negligible	845
Calpet	0.00037	0.00053	40
Fontenelle Recreation Area	negligible	negligible	1,210

[1] Risk values shown in this table, such as 0.00053, mean 53 chances per 100,000.

[2] Significant exposures are those that would cause eye irritation, coughing, loss of smell, or other discomfort.

[3] Includes people in incorporated and unincorporated area.

[4] Neglible means that the modeling analysis indicates no risk.

lethal exposure at Calpet by about 23 percent (from 0.00048 to 0.00037). The annual risk of discomfort exposure at Calpet is reduced even more, about 45 percent (from 0.00093 to 0.00053) with this additional block valve spacing. The annual risk of discomfort exposure declines to negligible at Big Piney/Marbleton and the Fontenelle Recreation Area, and declines by about 80 percent (from 0.00033 to 0.000068) at LaBarge.

NORTHERN ALTERNATIVE WITH ADDITIONAL BLOCK VALVES

For the Northern Alternative the Quasar trunk line was modeled with 10-mile block valve spacing (as proposed) away from the designated populated areas, and as before with additional 2-mile block valve spacing near the population areas. Northwest's trunk line was modeled with 5-mile block valve spacing (as proposed) away from the population areas, 2.5-mile near populated areas, and as before, with additional 1-mile block spacing near the population areas.

The modeling analyses were carried out and a corresponding risk assessment was performed for the Northern Alternative with mitigation by additional block valves. The results are shown in Table B.9-4. It was found that, with these additional block valves, none of the population areas would be at annual risk of significant exposures.

EFFECTS OF ADDITIONAL BLOCK VALVES ON EXPOSURE DISTANCES

Table B.9-5 shows the effects of additional block valves on the downwind distances for significant H_2S exposure from trunk line ruptures. Exposure distances would depend not only on block valve spacing but also on pipeline diameter and atmospheric conditions. These parameters are summarized for all trunk lines (30 inches and larger) for each applicant and alternative.

CONCLUSION

Use of additional block valves along trunk line segments near population areas can appreciably reduce the risk of significant impacts from the Proposed or Alternative Actions:

- The small community of Calpet is expected to experience an appreciably smaller risk of lethal exposure under the Proposed

TABLE B.9-4

ANNUAL RISK TO POPULATED AREAS FROM NORTHERN ALTERNATIVE WITH ADDITIONAL BLOCK VALVES

Populated Area	Individual Risk of Lethal Exposure	Individual Annual Risk of Significant Impact[1]	Approximate Number of People (1990)[2]
LaBarge	negligible[4]	negligible	1,212
Big Piney	negligible	negligible	1,217
Marbleton	negligible	negligible	1,171
Calpet	negligible	negligible	56
Fontenelle Recreation Area	negligible	negligible	1,210

[1] Significant exposures are those that would cause eye irritation, coughing, loss of smell, or other discomfort.

[2] Includes people in incorporated and unincorporated area.

[3] Neglible means that the modeling analysis indicates no risk.

TABLE B.9-5

DOWNWIND DISTANCES FOR SIGNIFICANT H_2S EXPOSURES FROM RUPTURES OF PROPOSED TRUNK LINES

			Downwind Distance for Lethal Dose (miles)		
Applicant	Trunk Line Diameter (inches)	Block Valve Spacing (miles)	Stable Atmosphere	Neutral Atmosphere	Unstable Atmosphere
Quasar (Proposed Action) and Exxon (Shute Creek Alternative)	30	10	2.5	0.9	0.4
	30	2[1]	1.7	0.8	0.4
Quasar (Buckhorn, Shute Creek, and Northern Alternatives)	36	10	3.5	1.2	0.6
	36	2[1]	2.1	1.1	0.4
Northwest (All Alternatives)	30	5	2.9	1.1	0.5
	30	2.5	2.2	0.9	0.4
	30	1[1]	1.6	0.8	0.3
			Downwind Distance for Significant Dose (miles)		
Quasar (Proposed Action) and Exxon (Shute Creek Alternative)	30	10	6.8	1.4	0.7
	30	2[1]	2.5	1.2	0.4
Quasar (Buckhorn, Shute Creek, and Northern Alternatives)	36	10	9.9	1.9	0.8
	36	2[1]	3.2	1.6	0.6
Northwest (All Alternatives)	30	5	5.6	1.7	0.7
	30	2.5	3.4	1.5	0.6
	30	1[1]	2.2	1.2	0.4

---

[1] Mitigation block valve spacing.

Action, Buckhorn Alternative, or Shute Creek Alternative. It is expected that none of the other population areas would experience an annual risk of lethal dose.

- Under either the Proposed Action, the Buckhorn Alternative, or the Shute Creek Alternative the risks of discomfort exposure at LaBarge, Big Piney/Marbleton, and the Fontenelle Recreation Area are reduced effectively to zero (except for LaBarge under the Shute Creek Alternative).

- Under the Northern Alternative, no risks of significant exposures are expected at any of the population areas.

ATTACHMENT C

Finding Of No Significant (FONSI) - Riley Ridge Natural Gas Project, Sour Gas Pipeline Alternatives.

Supplemental Environmental Assessment To The Riley Ridge Natural Gas Project FEIS - Sour Gas Pipeline Alternatives.

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

RILEY RIDGE NATURAL GAS PROJECT, SOUR GAS PIPELINE ALTERNATIVES

The attached environmental assessment (EA) supplements the Riley Ridge Natural Gas project final environmental impact statement (FEIS). The EA analyzes three slightly different sour gas pipeline routes from the well field to the Craven Creek and the Shute Creek plant sites. The purpose of this EA is to identify any additional impacts which might result from development of these routes which would differ from those analyzed for the proposed action route.

This FONSI serves as the decision on whether or not a supplemental EIS is necessary for the above actions. A record of decision will be prepared on the project that will state the decisions on actions analyzed in the FEIS as well as those analyzed in this EA.

If any of the alternative routes described in this EA are selected, all mitigation measures required or recommended in Chapter 4 of the DEIS and all changes, deletions, and additions as stated in the FEIS, will also be required or recommended.

Based upon the analysis in the attached EA, I find that these additional routes as mitigated would not have a significantly different impact on the human environment than those which were analyzed in the FEIS. Therefore, I conclude that no supplemental EIS is necessary.

P D Leonard

State Director, Wyoming

January 25, 1984

Date

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT TO THE RILEY RIDGE NATURAL GAS PROJECT FEIS SOUR GAS PIPELINE ALTERNATIVES

LOCATED IN

SUBLETTE & LINCOLN COUNTIES
WYOMING

Prepared by
Division of EIS Services
Denver Service Center

JANUARY 1984

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CHAPTER 1

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

INTRODUCTION

The Riley Ridge Project is a natural gas development project which includes the construction, operation, and abandonment of a deep gas well field in western Wyoming; gathering lines for the transportation of sour gas within the well field, gathering lines to the treatment plants; the treatment plants, sales gas pipelines; for delivery of sales gas to existing gas transmission pipelines, and facilities for the handling and transportation of by-products (sulfur and carbon dioxide) to markets. The project represents three individual projects proposed by:

1. Northwest Pipeline Corporation and Mobil Oil Corporation
2. Exxon Company, U.S.A.
3. American Quasar Petroleum Company and Williams Exploration Company

Major project actions and components consist of the following: (1) exploration, development, and abandonment of a 159,928-acre, low-Btu gas well field; (2) construction, operation, maintenance, and abandonment of four sour gas treatment plants with a total processing capacity of 2.8 billion cubic feet per day (cfd) and producing 576 million cfd of methane; (3) construction, operation, maintenance, and abandonment of associated rights-of-way for gathering lines, trunk lines, railroads, access roads, transmission lines, and other ancillary facilities; and (4) processing and transportation of products and by-products.

The applicants have applied to the U.S. Department of the Interior (DOI), Bureau of Land Mangement (BLM) for right-of-way permits to cross federal land managed by the BLM and Forest Service (FS). An enivronmental impact statement (EIS) was prepared jointly by BLM and FS. The BLM assumed the administrative lead and was responsible for filing the EIS with the Environmental Protection Agency.

In addition to the proposed project, numerous component alternatives and siting alternatives were evaluated in the EIS. These included a sulfur transport alternative, power supply alternative, and an employee housing alternative; and the Buckhorn, Shute Creek, and Northern sour gas treatment plant siting alternatives; as well as an No Action Alternative.

The EIS identified possible impacts to the Health and Safety of residents who live near one of the sour gas pipelines, if a rupture were to occur. Comments from the general public also showed a concern to reduce this risk as much as possible.

As a result of these concerns revised mitigation measure H-4, (page 3-9 of the FEIS) states:

> No sour gas trunk line will be located closer than 1 mile to a populated area or sensitive receptor as identified on Map 2-1 in the FEIS. The applicants must use the best available engineering design (i.e., alignment, block valve type and spacing, pipe grade, etc.), best construction techniques (i.e., pipe depth, hydrostatic testing, etc.),

and monitoring plans (i.e., surveillance, warning signs, etc.) as approved by the Authorized Officer to minimize both the probability of rupture and radius of exposure in the event of an accidental pipeline release of sour gas.

A variance from the 1-mile distance may be granted by the Authorized Officer based on detailed site-specific analysis that would consider meteorology, topography, and special pipeline design and/or construction measures. This analysis would ensure that populated areas and sensitive receptors would not be exposed to an increased level of risk.

Three (3) alternative routes, all of which meet this mitigation measure, are being looked at in this EA. See Map-1 for their locations.

All routes will start at the well field and end either at the Craven Creek plant or the Shute Creek plant sites which is the same as the route analyzed in the DEIS and FEIS. The majority of the alternative routes are within the previously analyzed 1-mile-wide corridor and do not vary more than 5 miles from the original route at any point.

This impact analysis is required before a decision can be made on the entire Riley Ridge project and before any right-of-way grants can be issued.

PURPOSE AND NEED

The purpose and need for the Riley Ridge Natural Gas project was identified in the DEIS (pages 1-3). Alternatives in this EA would merely consider and evaluate different route to serve the purpose and fulfill the need as identified in the DEIS, and to meet the requirements of the revised mitigation measure H-4.

PROPOSED ACTION

General Description

The proposed action of this supplemental EA is the identification and construction of sour gas pipelines from the well field terminus of Exxon and NW to the Craven Creek and Shute Creek plant sites. This was originally described and analyzed under the Shute Creek alternative in the Riley Ridge DEIS and FEIS.

The selection of any alternative described in this EA and shown on Map 1 would not change the construction schedule or any of the methods of construction as described in the DEIS or FEIS.

Alternative 1

The alignment for this alternative would start in the well field terminus, (Big Piney Compressor Station for Northwest Pipeline Company and near Dry Piney Camp for Exxon Company) and progress south and slightly east to a point approximately 1 mile east of Calpet. From there, both pipelines would head south and cross LaBarge Creek and then cross Fontenelle Creek in Section 2, T24N and R113W. After crossing Fontenelle Creek, northwest pipeline would head southwest to the Craven Creek plant site and Exxon's would head southeast to the Shute Creek site.

Alternative 2

In this alternative, the pipeline would leave the well field the same as described under Alternative 1 but would stay west of Calpet, along the toe of the Hogsback Mountain, until it crossed LaBarge Creek near the narrows in Section 19, T26N and R113W. From just south of LaBarge Creek it would angle east and a little south until it intersects Alternative 1, after which it would be the same as in Alternative 1.

Alternative 3

This alternative would begin the same as Alternative 2 but after crossing LaBarge Creek the pipeline would continue south and east down Holden Hollow where it would intersect with the Alternative 1 route just north of Fontenelle Creek. From there on the route would be the same as in Alternative 1.

CHAPTER 2

COMPARATIVE ANALYSIS

The following table compares only the impacts that are different from the proposed action as described in the Riley Ridge EIS. All other impacts would be the same or are so minor that they are insignificant.

COMPARISON OF MITIGATED IMPACTS[1]

Item	Proposed Action	Alternative 1	Alternative 2	Alternative 3
HEALTH & SAFETY				
Miles of sour gas trunk line	55	60.5 (+5.5)	62 (+7)	62.5 (+7.5)
Number of trunk line ruptures expected during life of project	0.33	0.36 (+0.03)	0.37 (+0.04)	0.38 (+0.05)
Sensitive Receptors within 1/2 mile of Trunkline	11	0(-11)	0(-11)	0(-11)
1 mile of line	14	5(-9)	2(-12)	2(-12)
2 miles of line	24	14(-10)	5(-19)	5(-19)
WILDLIFE				
Elk winter range areas	154	220 (+66)	238 (+84)	244 (+90)
Deer critical winter range	175	241 (+66)	259 (+84)	265 (+90)
Pronghorn critical winter/yearlong	132	198 (+66)	216 (+84)	222 (+90)
AGRICULTURE/GRAZING				
Acres disturbed during construction	660	726 (+66)	744 (+84)	750 (+90)
number of livestock AUMs lost in construction	37	41 (+4)	41.5 (+4.5)	42 (+5)

[1] NOTE: Numbers shown in parens are the difference between that alternative and the preposed action.

CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The proposed action pipeline routes (as described in the Riley Ridge EIS) and the alternatives (as described in this document) begin and end at the same point, whth minor variations of several miles. Therefore, the description of the affected environment is the same as that discussed in the EIS.

Furthermore, there would be no change in impacts for the following resources, since the only differences among the alternatives are primarily a function of on-the-ground location: socioeconomics, water resources, air quality, visual resources, cultural resources, recreation resources, wilderness, timber resources, transportation networks, land use plans, controls and constraints, and noise. Nor would there be any difference in the Mandatory Items listed below:

Threatened or Endangered Species
Floodplains and Wetlands
Wilderness Values, Areas of Critical Environmental Concern, and Wild and Scenic Rivers.
Visual Resource Management
Prime or Unique Farmlands
Social and Economic Values
Cultural or Historical Resource Values
Water Quality

Air Quality

BLM Land Use Plan Conformance.

Impacts which do differ are discussed below.

WILDLIFE AND FISHERIES

Alternative 1

During construction, 66 more acres of elk winter range, critical deer winter range, and critical winter/yearlong pronghorn range would be disturbed for two seasons.

Alternative 2

During construction, 84 more acres of elk winter range, critical deer winter range, and critical winter/yearlong pronghorn range would be disturbed for two seasons.

Alternative 3

During construction, 90 more acres of elk winter range, critical deer winter range, and critical winter/yearlong pronghorn range would be disturbed for two seasons.

There would be no change in fisheries, since the same streams would be crossed in every case.

HEALTH & SAFETY

Alternative 1

Five (5) sensitive receptors would be located a little less than one mile from the pipeline and would require a variance. The town of Calpet is one of the five.

Fourteen receptors would be located within 2 miles of the line.

In addition, two (2) trailers would have to be purchased and/or moved. The line would be 60.5 miles in length. The number of expected ruptures, over the life of the project being 0.36.

Alternative 2

Two (2) receptors would be located a little less than a mile from the line which would require a variance.

Five (5) receptors would be located within 2 miles of the line.,

The line would be 62 miles long, with the number of expected ruptures over the life of the project being 0.37

Alternative 3

Two (2) receptors would be located a little less than a mile from the line, which would require a variance.

Five (5) receptors would be located within 2 miles of the line.

The line would be 62.5 miles long with the number of expected ruptures over the life of the project being 0.38.

SOILS AND VEGETATION

During construction, Alternative 1 would disturb 66 more acres than the proposed action; Alternative 2 would disturb 84 more acres; and Alternative 3 would disturb 90 more acres.

There would be no change in the number of sensitive rehabilitation acres disturbed.

AGRICULTURE/GRAZING

During construction, Alternative 1 would disturb 726 acres for two years, and 41 AUMS would be lost.

Alternative 2 would disturb 744 acres, with the loss of 41.5 AUMs.

Alternative 3 would disturb 750 acres, with the loss of 42 AUMS.

UNAVOIDABLE ADVERSE IMPACTS AND LONG-TERM ENVIRONMENTAL CONSEQUENCES

Since any variations in the supplemental alternatives would take place during the construction phase, no significant impacts or consequences would take place from those previously analyzed in the Riley Ridge EIS.

ATTACHMENT D

Application For Permit To Drill (APD).
Environmental Reference Report and Decision Record.
Riley Ridge Wellfield Development Environental Factors/Identified
Mitigating Measures Checklist
Erosion Control, Revegetation And Restoration Plan (ERRP)

ATTACHMENT D

APPLICATION FOR PERMIT TO DRILL (APD) ENVIRONMENTAL REFERENCE REPORT AND DECISION RECORD

In order to make the Riley Ridge EIS and its supporting technical reports usuable tools, the following processing procedure will be used for wellfield activities:

Step		Day
1.	Initial written request from Company.	1
2.	Initial analysis, scoping and ID Team identification	3
3.	ID Team field review	15
4.	Final analysis and mitigation requirements sent to Company	20
5.	Recommendations to BLM District Office	25
6.	Approval of APD	30

The purpose of this procedure is to ensure all environmental concerns in the EIS are addressed, minimize time spent on paperwork, and ensure that the Companies have enough information to submit a completed APD.

Step 1 may be made by telephone, but Government will ask for written follow-up. The clock will not start until written request is received. The Riley Ridge sensitivity analysis Record of Decision, EIS, and technical reports will be used to accomplish Step 2. A brief field trip may also be necessary at this time. From this step, the ID Team will be formed and scoping initiated. No later than fifteen days following Step 1, Step 3 will take place with the ID Team in the field, season permitting. The final analysis will take place no more than ten days following Step 3. It will be documented in final form on the attached form. Special problems and special mitigations not covered in the EIS may have to be appended. This document will be sent with recommendations to the BLM District Office.

Within five days following the field inspection, Step 4, BLM will inform the Company of all requirements so that it is able to submit a completed APD.

Reference #RR8__-__ __

BLM/USFS
ENVIRONMENTAL REFERENCE REPORT AND DECISION RECORD
RILEY RIDGE WELLFIELD DEVELOPMENT

---

1. Applicant ____________________ 2. Case Serial Number or Well Number __________ 3. Administrative Area ________________________

4. Project Location: T. ____________ R. ____________ S. ____

5. Project Description: ____

6. Purpose and Need of Project/Proposal ____

7. Summary of the Analysis of Environmental Consequences of the Proposed Project and Alternatives:

A. References (On file at BLM offices in Rock Springs and Pinedale, Wyoming; and USFS offices in Big Piney, Wyoming and Supervisor's Office in Jackson, Wyoming).

1. Draft Environmental Impact Statement (DEIS), Final Environmental Impact Statement (FEIS)
2. Record of Decision (ROD)
3. Sensitivity Analysis (SA)
4. ____________________________________

RECORD OF ANALYSIS

The project/proposal will have the effect indicated on the following elements:

B. Element

Environmental Factors Overlay #	Negligible Effect	Consequential Effect[1]	Element Was Adequately Addressed in (Give Specific Document Reference - Page Numbers)	Additional Analysis/Field Reconnaissance	Mitigating/Monitoring Measures
Climate, Air Quality 5					
Surface Geology					
Subsurface Geology					
Surface Water 3,4					
Ground Water 3,4					
Timber 8					
Livestock Grazing					
Terrestrial Wildlife 9 thru 12					

Environmental Factors Overlay #	Negligible Effect	Consequential Effect[1/]	Element Was Adequately Addressed in (Give Specific Document Reference - Page Numbers)	Additional Analysis/Field Reconnaissance	Mitigating/Monitoring Measures
Aquatic Wildlife 12					
Recreation, H_2S Receptors 14					
Visual 16,17,18					
Land Uses/Existing Facilities 1,2,3					
Socioeconomic Conditions					
Soils, Vegetation, Reclamation 6,7,8					
Mandatory Items					
ACEC					
Unique Resources (identify)					
T&E Species (identify) 12					
Cultural or Historic Resources 15					
Wilderness/Wilderness Study Area					
Wild/Scenic River					
Flood Plains/Wetlands/etc.					
Prime Source of Drinking Water					
Public Health or Safety (Site Specific)					
Other Factors					
Violates Local/State/Federal Law					
Involves Uncertain/Unique Risks					
Involves Unresolved Resource Conflicts					
Sets a Precedent					
Is Highly Controversial					

[1/] Item not addressed in the EIS or other reference documents and/or mitigation not defined.

9. Conclusion:

BLM ___ FS ___ BLM/FS ___

A. FINDING - Based on the preceding review documented above, including referenced and attached mitigation (6 + 8F, 7 + 7F), I find that this action will (not) have a significant impact on the human environment and, therefore conclude that (no) (an) EA/EIS is necessary.

Prepared by: ______________ ______________ ______________ ______________

Name Agency Title Date

______________ ______________ ______________ ______________

Name Agency Title Date

______________ ______________ ______________ ______________

Name Agency Title Date

Concur: ______________ ______________

USFS District Rangers Date

______________ ______________

BLM Area Manager Date

Recommended Approval: ______________ ______________

Forest Supervisor, Bridger-Teton National Forest Date

B. Decision/Rationale.

1. Decision: The proposal is (approved)(rejected) as (submitted)(modified)(recommended in the Land Report). This recommendation (is)(is not) consistent with the ______________(LVP)(BMP)(MFP)(RMP).

2. Rationale for rejection or modification: ______________

____

Approval: ______________ ______________ ______________

Name Title Date

C. Cumulative Impact Assessment/Recommendation: ____________________

D. Irreversible or Irretrievable Commitment of Resources: ____________________

E. Adverse Residual Impacts (after mitigation): ____________________

F. Additional Mitigation/Monitoring (see attachments): ____________________

8. Specialists Included in this Review: ____________________

Page 3 of 4

RILEY RIDGE WELLFIELD DEVELOPMENT

ENVIRONMENTAL FACTORS/IDENTIFIED MITIGATING MEASURES CHECKLIST

Environmental Factors	* Identified Mitigating and Monitoring Measures
Climate, Air Quality	* AQ1, AQ2, H6
Surface Geology	*
Subsurface Geology	* H3, W1, W2
Surface Water	* WF9, WF10, WF12, WF13, WF14, T2; * B.5-30,31,32,33
Ground Water	* W1,W2
Timber	* SV4
Livestock Grazing	* WF2, AG1, WF5, WF14, SV4
Terrestial Wildlife	* WF1 thru WF11, WF14, WF15, B.5-49
Aquatic Wildlife	* WF1,WF2, WF5, WF9 thru WF14
Recreation, H_2S Receptors	* H1 thru H5, AQ2, B.5-47
Visual	* V1 thru V7, SV1, SV4, L2, B.5-41,42
Land Uses/Existing Facilities	* WF1, WF2, SV1, L1,L2, WF4, 2801.2A(3), * 2881.2A(4), B.5-3,48,49.
Socioeconomic Conditions	* S1
Soils, Vegetation, Reclamation	* WF5, WF9, WF10, SV1 thru SV3, T2, SV4, L2; * B.5-34thru 40, B.7.
ACEC	*
Unique Resources	* WF1
T&E Species	* WF1, WF2, WF7, WF8, WF9, WF10, WF13, WF14, * B.5-27, 28, 29
Cultural or Historic Resources	* B.5-43,44,45,46
Wilderness/Wilderness Study Area	* AQ1, H6
Wild/Scenic River	*
Flood Plains/Wetlands/Etc	* WF5, WF9 thru WF14, SV2
Prime Source of Drinking Water	* WF9 thru WF14,
Public Health or Safety	* WF2, WF10, WF12, WF13, H1 thru H5, W1, W2 * AQ1, AQ2, T1, T3, T4
Violates Local/State/Federal Law	* WF1, H1 thru H6
Involves Uncertain/Unique Risks	* W1, W2
Involves Unresolved Resource Conflicts	* * W1, W2
Sets a Precedent	* AQ1
Is Highly Controversial	* S1, WF3, WF5, H3, AQ1, H6

EROSION CONTROL, REVEGETATION AND RESTORATION PLAN (ERRP)

The purpose of developing an ERRP is to allow for cooperative innovation in reclamation of a disturbed area to a predetermined land use for wellfield and treatment plant activities. The following is an outline of topics to be covered in an ERRP, all ERRPs must address these points; however they are not limited to them. Although the ERRP is a formal document, amendments can be approved by the Authorizing Officer. It is important to note that while an ERRP is a site specific document, it must reflect all requirements set forth in Attachment B of the Record of Decision. To aid in the development of ERRPs, refer to Table 5-1 to page 5-13 in the sensitivity analysis technical report.

EROSION CONTROL, REVEGETATION, AND RESTORATION PLAN (ERRP)

I. INTRODUCTION

- o Clear identification of reclamation goal
  - This is to be identified by the Federal Land Management (FLM) agency concerned.

- o Short description of activity causing disturbance and project timeframes.
  - Proposed Start Date
  - Duration of Project
  - Completion Date
  - End of Project Life (Estimate)

- o Set timeframes for ERRP.
  - Seasonal reviews to initiate change
  - When plan will be considered implemented

II. OBLIGATION

- o Exactly who (Individual name, address, phone) is responsible for what in the:
  - Design of Plan*
  - Execution of Plan*
  - Monitoring of Progress*

* An experienced and trained professional (i.e. soil scientist, reclamation specialist) that has been approved by the Authorized Officer (AO) is required to prepare and lead the implementation and monitoring of this plan.

III. SITE MAP FOR PROJECT* TO INCLUDE:

- o Soil Descriptions and Boundaries
- o Symbols
  - Rock Outcrop
  - Photo Record Point
  - Springs and Wet Spots
- o Location and Volume of Proposed Material Stockpiles
  - Time Material Will be Stored
  - Type of Material in Pile
- o Identify Existing Drainage Patterns
- o Identify Existing Vegetative Cover
- o Identify Existing ORV or Two Track Roads

* This information should not just cover the proposed disturbed area but should extend beyond site boundaries by approximately 150 yards.

IV. ZERO RUNOFF

- All Disturbed sites, except linear rights-of-way, will maintain zero runoff* until the area is stabilized. Stabilization** will be a value that must be clearly defined in the plan.

- The AO can approve a variance from zero runoff based on detailed site specific analysis that would consider meteorology, topography, water quality and special site design and/or construction measures.

*Zero runoff for purposes of the ERRP means: no portion of natural or man caused liquid will leave the disturbed area by either surface or sub-surface flow.

**Stabilization for purposes of the ERRP is to mean: that point in time when neither erosion nor deposition occurs which is greater than pre-disturbance. This point must be measurable (site monitoring) and self sustaining, i.e., not dependent on site maintenance.

V. EROSION CONTROL MEASURES

- Description of proposed measures
  - Identify levels of runoff planned for, i.e.: 50 year storm, etc.
  - Include capacity of all retention structures and engineering design.
- Map locating erosion control measures placement
  - Include Zero Runoff Measures

VI. FUGITIVE DUST CONTROL

- Watering or other approved dust abatement procedures will be done to prevent severe wind erosion and loss of soil materials during construction.

- Describe
  - How and When

VII. REVEGETATION

- Type
  - Seed
  - Established Stock

- Site preparation

- Planting
  - Planting Timeframes
  - Planting Method and Equipment

- Fertilization program
  - Rationale for Fertilizing or Not Fertilizing

VIII. MONITORING SITE RECLAMATION PROGRESS

- Methods
- Timeframes
- Photo Record Station (with location) of site pre-disturbance

IX. SITE ABANDONMENT AND RELEASE

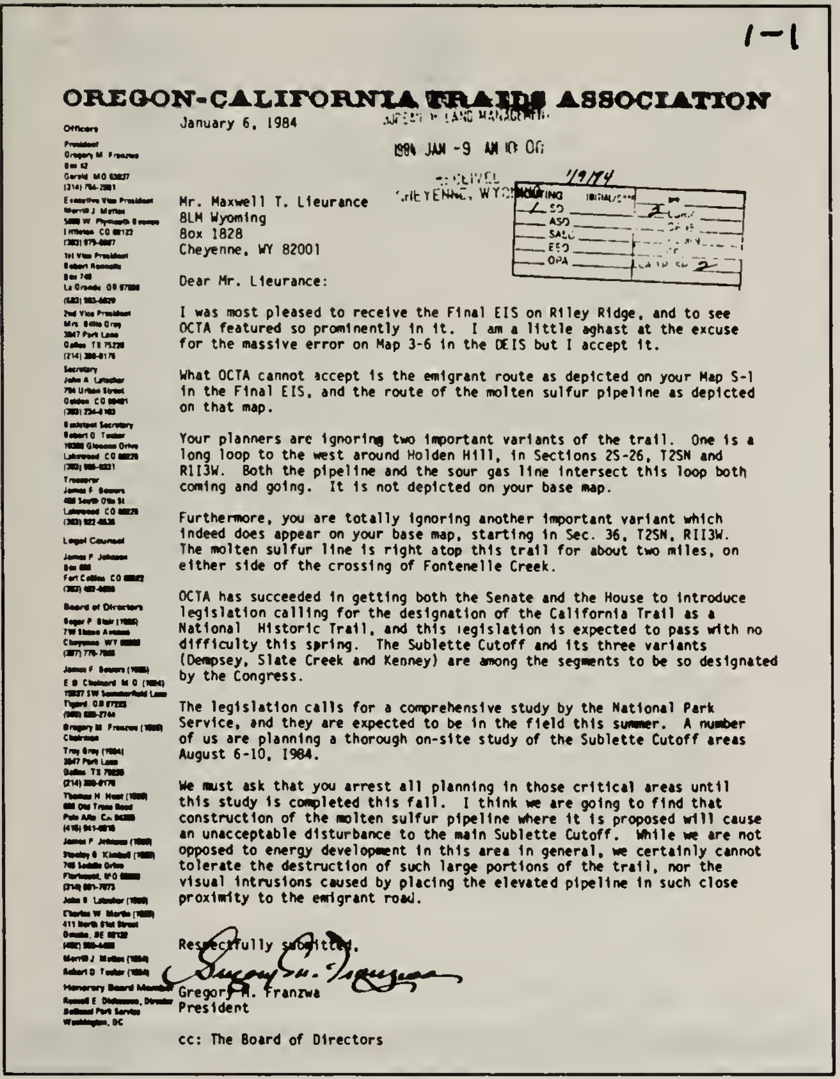
- Include timeframes

X. POTENTIAL PROBLEMS

- Address possible weak points
  - Erosion
  - Slumping
  - ORV Use
    i.e., cover points that might conflict over ERRP implementation with area land use goals.
  - Snow (management)
  - Company fire policy (weed control) vs. vegetation management goals.

ATTACHMENT E

Public Comments Received On The Riley Ridge Final EIS.



1-1

OREGON-CALIFORNIA TRAILS ASSOCIATION

January 6, 1984

BUREAU OF LAND MANAGEMENT
1984 JAN -9 AM 10 00
RECEIVED
CHEYENNE, WYOMING

1/9/84

ROUTING
SO
ASO
SASO
ESO
OPA

Mr. Maxwell T. Lieurance
BLM Wyoming
Box 1828
Cheyenne, WY 82001

Dear Mr. Lieurance:

I was most pleased to receive the Final EIS on Riley Ridge, and to see OCTA featured so prominently in it. I am a little aghast at the excuse for the massive error on Map 3-6 in the DEIS but I accept it.

What OCTA cannot accept is the emigrant route as depicted on your Map S-1 in the Final EIS, and the route of the molten sulfur pipeline as depicted on that map.

Your planners are ignoring two important variants of the trail. One is a long loop to the west around Holden Hill, in Sections 25-26, T25N and R113W. Both the pipeline and the sour gas line intersect this loop both coming and going. It is not depicted on your base map.

Furthermore, you are totally ignoring another important variant which indeed does appear on your base map, starting in Sec. 36, T25N, R113W. The molten sulfur line is right atop this trail for about two miles, on either side of the crossing of Fontenelle Creek.

OCTA has succeeded in getting both the Senate and the House to introduce legislation calling for the designation of the California Trail as a National Historic Trail, and this legislation is expected to pass with no difficulty this spring. The Sublette Cutoff and its three variants (Dempsey, Slate Creek and Kenney) are among the segments to be so designated by the Congress.

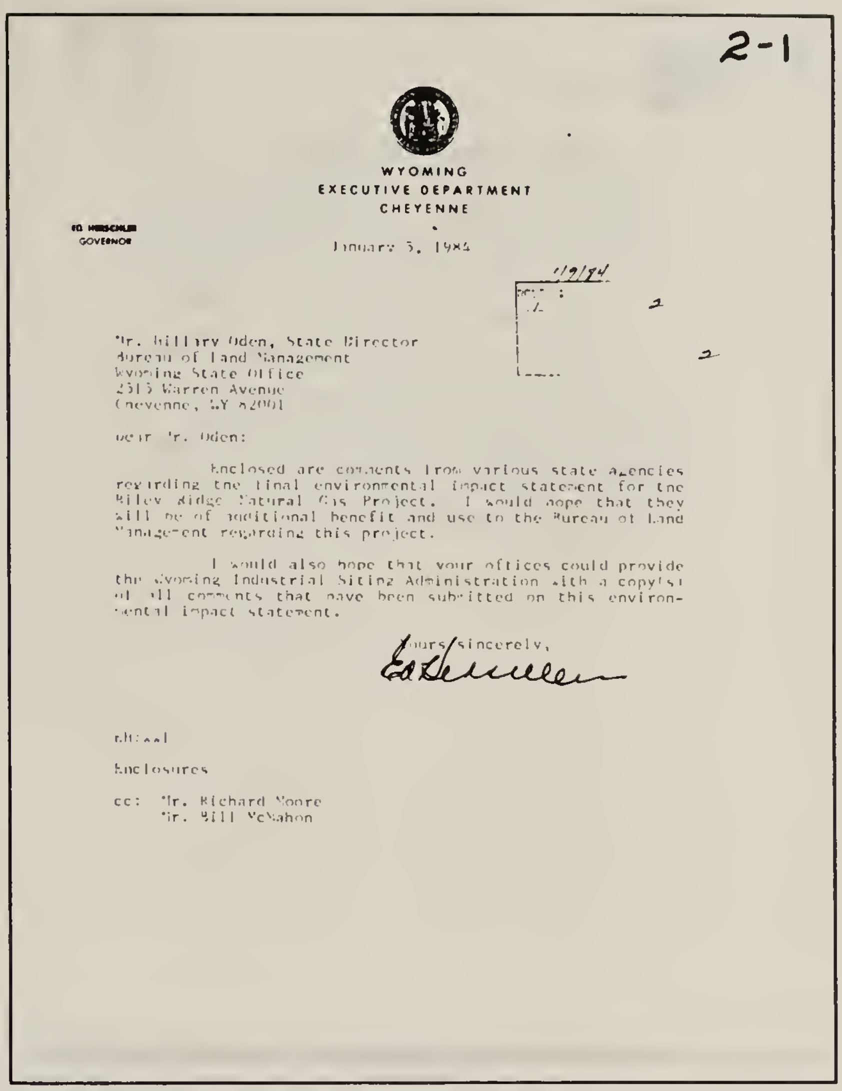
The legislation calls for a comprehensive study by the National Park Service, and they are expected to be in the field this summer. A number of us are planning a thorough on-site study of the Sublette Cutoff areas August 6-10, 1984.

We must ask that you arrest all planning in those critical areas until this study is completed this fall. I think we are going to find that construction of the molten sulfur pipeline where it is proposed will cause an unacceptable disturbance to the main Sublette Cutoff. While we are not opposed to energy development in this area in general, we certainly cannot tolerate the destruction of such large portions of the trail, nor the visual intrusions caused by placing the elevated pipeline in such close proximity to the emigrant road.

Respectfully submitted,

Gregory M. Franzwa
President

cc: The Board of Directors



2-1

WYOMING
EXECUTIVE DEPARTMENT
CHEYENNE

ED HERSCHLER
GOVERNOR

January 5, 1984

1/9/84

Mr. Hillary Oden, State Director
Bureau of Land Management
Wyoming State Office
2515 Warren Avenue
Cheyenne, WY 82001

Dear Mr. Oden:

Enclosed are comments from various state agencies regarding the final environmental impact statement for the Riley Ridge Natural Gas Project. I would hope that they will be of additional benefit and use to the Bureau of Land Management regarding this project.

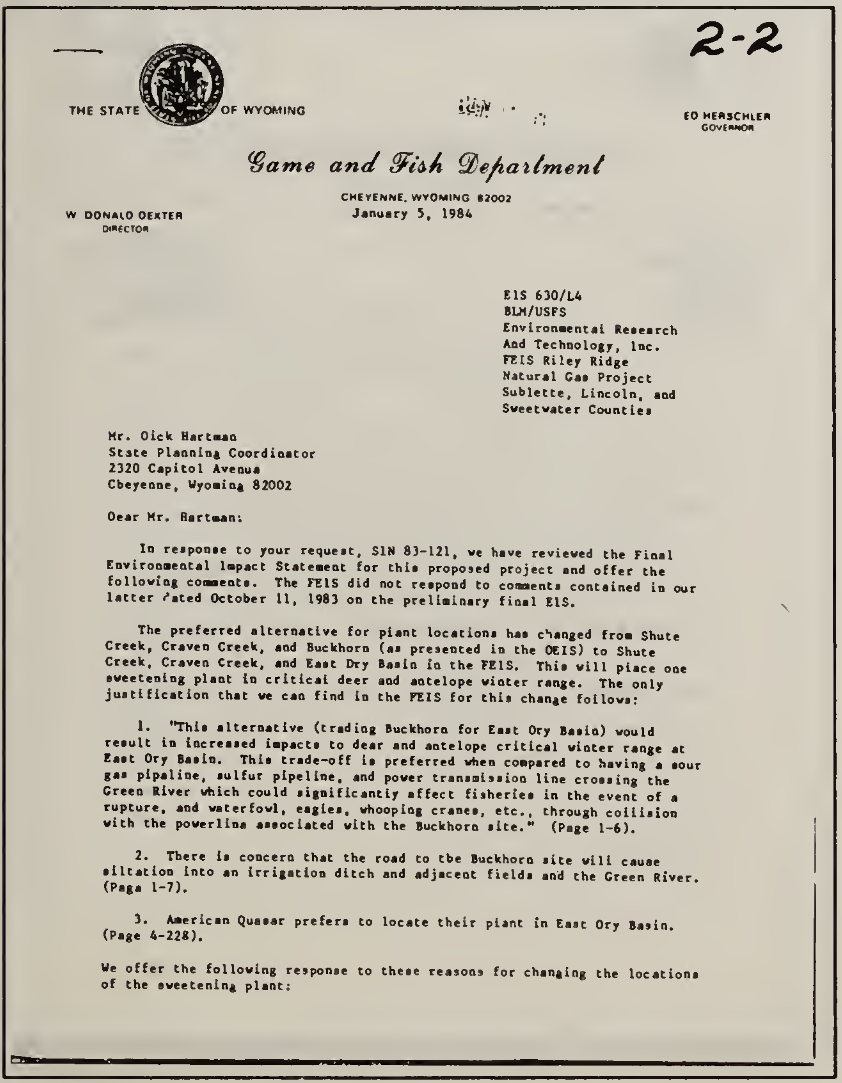
I would also hope that your offices could provide the Wyoming Industrial Siting Administration with a copy(s) of all comments that have been submitted on this environmental impact statement.

Yours sincerely,

EH:awl

Enclosures

cc: Mr. Richard Moore
Mr. Bill McMahon



2-2

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Game and Fish Department

CHEYENNE, WYOMING 82002

W. DONALD DEXTER
DIRECTOR

January 5, 1984

EIS 630/L4
BLM/USFS
Environmental Research
And Technology, Inc.
FEIS Riley Ridge
Natural Gas Project
Sublette, Lincoln, and
Sweetwater Counties

Mr. Oick Hartman
State Planning Coordinator
2320 Capitol Avenue
Cheyenne, Wyoming 82002

Dear Mr. Hartman:

In response to your request, SIN 83-121, we have reviewed the Final Environmental Impact Statement for this proposed project and offer the following comments. The FEIS did not respond to comments contained in our letter dated October 11, 1983 on the preliminary final EIS.

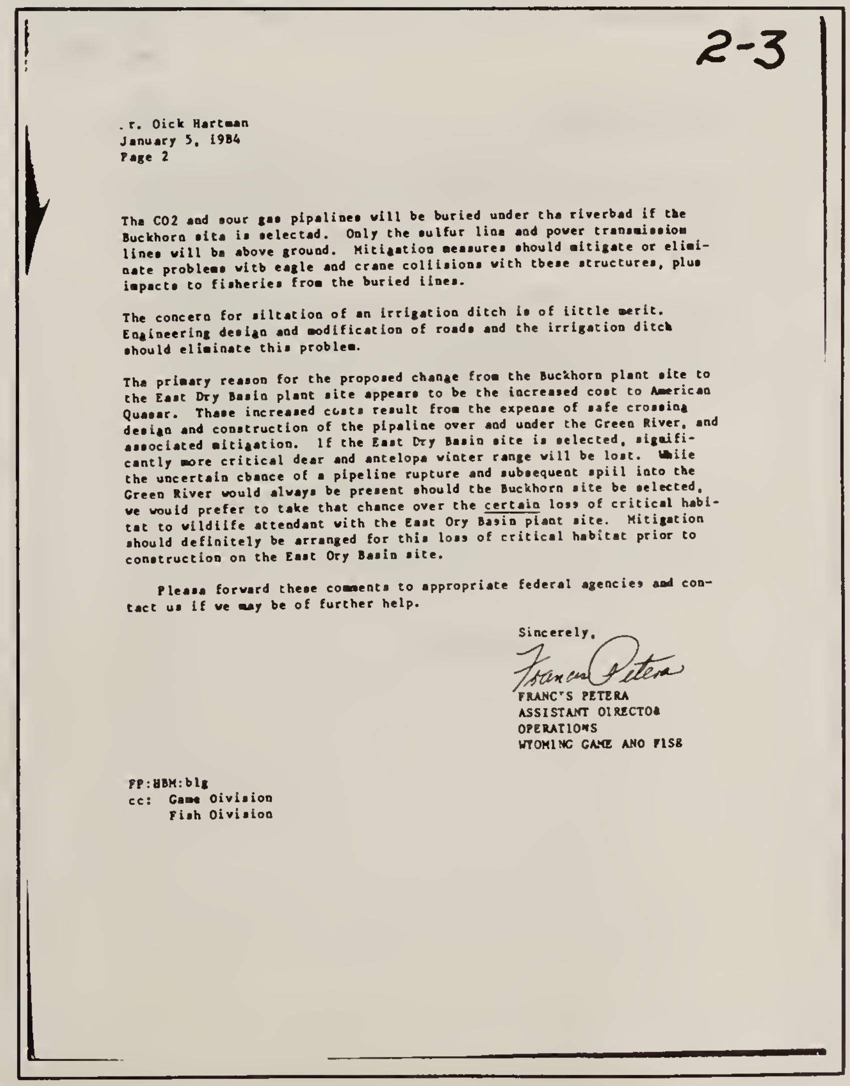
The preferred alternative for plant locations has changed from Shute Creek, Craven Creek, and Buckhorn (as presented in the DEIS) to Shute Creek, Craven Creek, and East Dry Basin in the FEIS. This will place one sweetening plant in critical deer and antelope winter range. The only justification that we can find in the FEIS for this change follows:

1. "This alternative (trading Buckhorn for East Dry Basin) would result in increased impacts to deer and antelope critical winter range at East Dry Basin. This trade-off is preferred when compared to having a sour gas pipeline, sulfur pipeline, and power transmission line crossing the Green River which could significantly affect fisheries in the event of a rupture, and waterfowl, eagles, whooping cranes, etc., through collision with the powerline associated with the Buckhorn site." (Page 1-6).

2. There is concern that the road to the Buckhorn site will cause siltation into an irrigation ditch and adjacent fields and the Green River. (Page 1-7).

3. American Quasar prefers to locate their plant in East Dry Basin. (Page 4-228).

We offer the following response to these reasons for changing the locations of the sweetening plant:



2-3

Mr. Oick Hartman
January 5, 1984
Page 2

The CO2 and sour gas pipelines will be buried under the riverbed if the Buckhorn site is selected. Only the sulfur line and power transmission lines will be above ground. Mitigation measures should mitigate or eliminate problems with eagle and crane collisions with these structures, plus impacts to fisheries from the buried lines.

The concern for siltation of an irrigation ditch is of little merit. Engineering design and modification of roads and the irrigation ditch should eliminate this problem.

The primary reason for the proposed change from the Buckhorn plant site to the East Dry Basin plant site appears to be the increased cost to American Quasar. These increased costs result from the expense of safe crossing design and construction of the pipeline over and under the Green River, and associated mitigation. If the East Dry Basin site is selected, significantly more critical deer and antelope winter range will be lost. While the uncertain chance of a pipeline rupture and subsequent spill into the Green River would always be present should the Buckhorn site be selected, we would prefer to take that chance over the certain loss of critical habitat to wildlife attendant with the East Dry Basin plant site. Mitigation should definitely be arranged for this loss of critical habitat prior to construction on the East Dry Basin site.

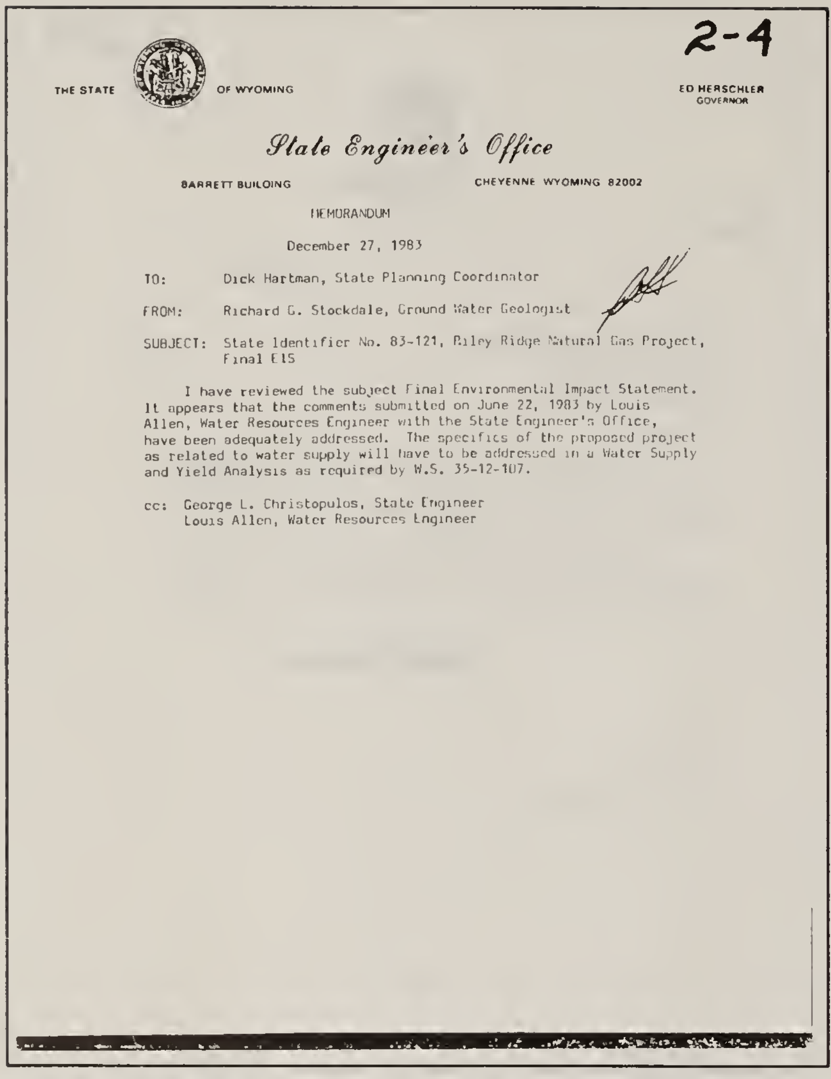
Please forward these comments to appropriate federal agencies and contact us if we may be of further help.

Sincerely,

Francis Petera

FRANCIS PETERA
ASSISTANT DIRECTOR
OPERATIONS
WYOMING GAME AND FISH

FP:HBM:blg
cc: Game Division
Fish Division



2-4

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

State Engineer's Office

BARRETT BUILDING CHEYENNE WYOMING 82002

MEMORANDUM

December 27, 1983

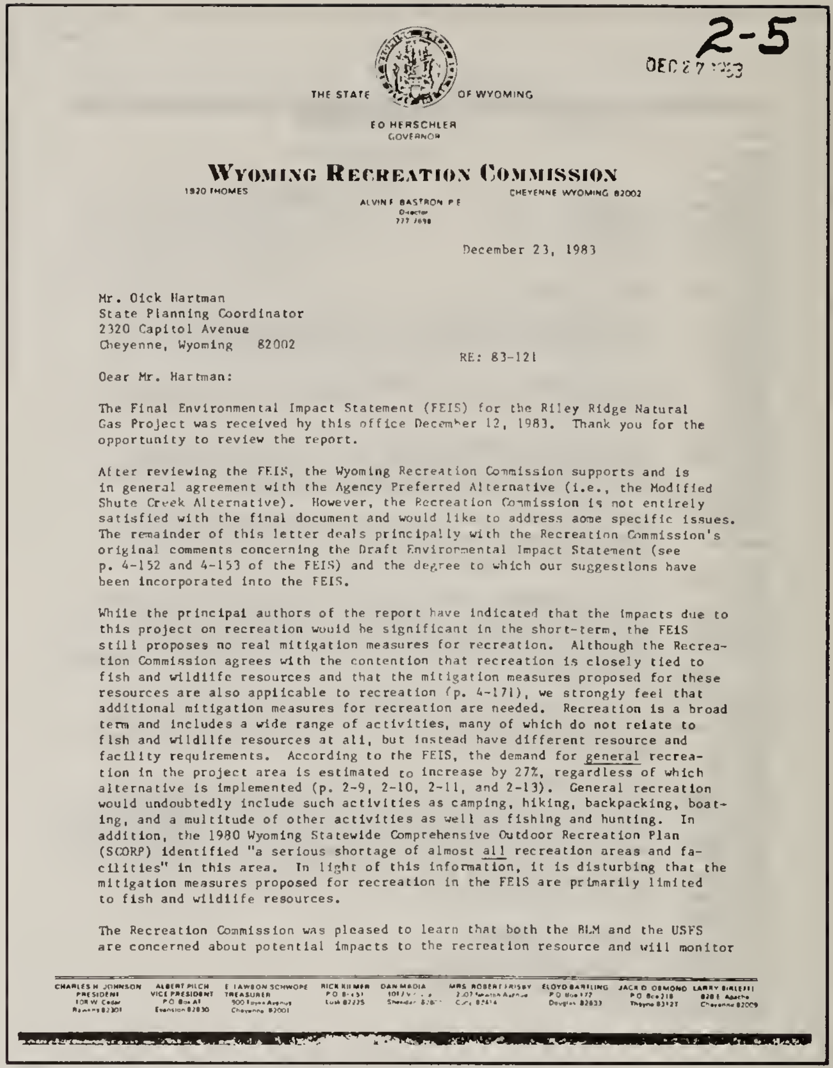
TO: Dick Hartman, State Planning Coordinator

FROM: Richard G. Stockdale, Ground Water Geologist

SUBJECT: State Identifier No. 83-121, Riley Ridge Natural Gas Project, Final EIS

I have reviewed the subject Final Environmental Impact Statement. It appears that the comments submitted on June 22, 1983 by Louis Allen, Water Resources Engineer with the State Engineer's Office, have been adequately addressed. The specifics of the proposed project as related to water supply will have to be addressed in a Water Supply and Yield Analysis as required by W.S. 35-12-107.

cc: George L. Christopulos, State Engineer
Louis Allen, Water Resources Engineer



2-5

DEC 27 1983

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

WYOMING RECREATION COMMISSION

1920 THOMES CHEYENNE WYOMING 82002

ALVIN F. BASTRON P.E.
Director
777-7698

December 23, 1983

Mr. Dick Hartman
State Planning Coordinator
2320 Capitol Avenue
Cheyenne, Wyoming 82002

RE: 83-121

Dear Mr. Hartman:

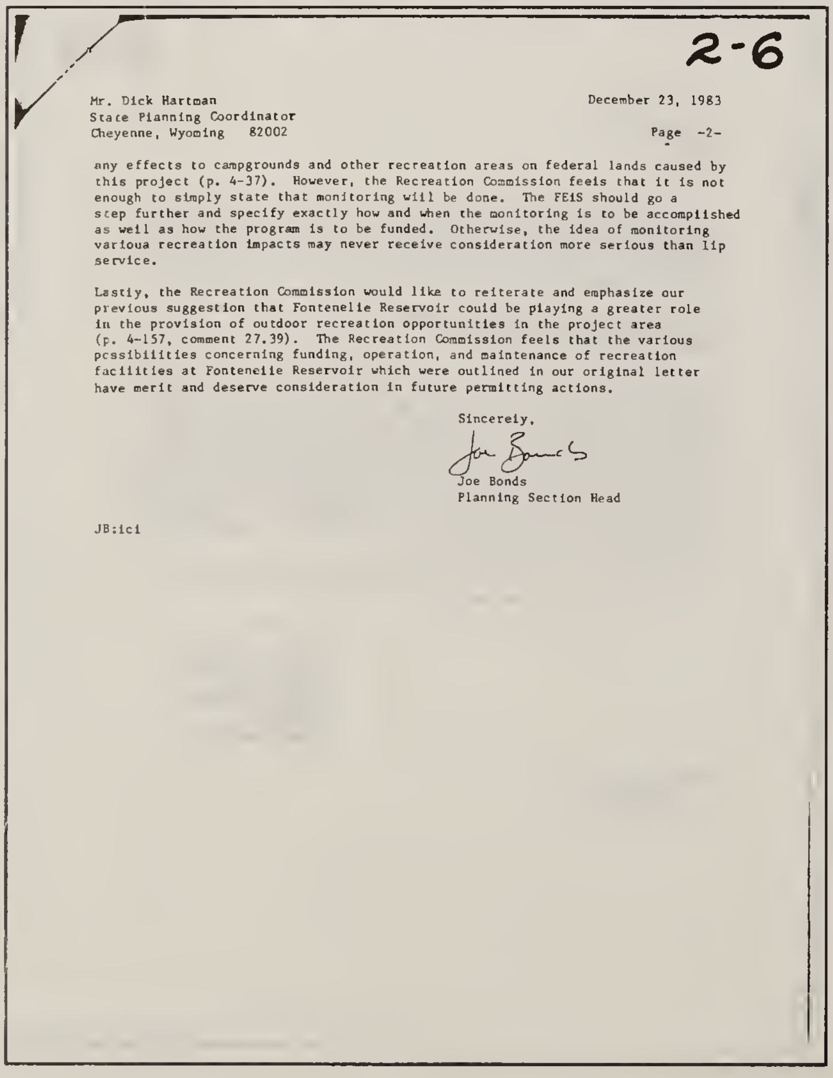
The Final Environmental Impact Statement (FEIS) for the Riley Ridge Natural Gas Project was received by this office December 12, 1983. Thank you for the opportunity to review the report.

After reviewing the FEIS, the Wyoming Recreation Commission supports and is in general agreement with the Agency Preferred Alternative (i.e., the Modified Shute Creek Alternative). However, the Recreation Commission is not entirely satisfied with the final document and would like to address some specific issues. The remainder of this letter deals principally with the Recreation Commission's original comments concerning the Draft Environmental Impact Statement (see p. 4-152 and 4-153 of the FEIS) and the degree to which our suggestions have been incorporated into the FEIS.

While the principal authors of the report have indicated that the impacts due to this project on recreation would be significant in the short-term, the FEIS still proposes no real mitigation measures for recreation. Although the Recreation Commission agrees with the contention that recreation is closely tied to fish and wildlife resources and that the mitigation measures proposed for these resources are also applicable to recreation (p. 4-171), we strongly feel that additional mitigation measures for recreation are needed. Recreation is a broad term and includes a wide range of activities, many of which do not relate to fish and wildlife resources at all, but instead have different resource and facility requirements. According to the FEIS, the demand for general recreation in the project area is estimated to increase by 27%, regardless of which alternative is implemented (p. 2-9, 2-10, 2-11, and 2-13). General recreation would undoubtedly include such activities as camping, hiking, backpacking, boating, and a multitude of other activities as well as fishing and hunting. In addition, the 1980 Wyoming Statewide Comprehensive Outdoor Recreation Plan (SCORP) identified "a serious shortage of almost all recreation areas and facilities" in this area. In light of this information, it is disturbing that the mitigation measures proposed for recreation in the FEIS are primarily limited to fish and wildlife resources.

The Recreation Commission was pleased to learn that both the BLM and the USFS are concerned about potential impacts to the recreation resource and will monitor

CHARLES H. JOHNSON PRESIDENT 108 W. Cedar Rawlins 82301 · ALBERT PILCH VICE PRESIDENT P.O. Box A1 Evanston 82930 · E. LAWSON SCHWOPE TREASURER 900 [illegible] Avenue Cheyenne 82001 · RICK KILMER P.O. [illegible] Lusk 82225 · DAN MADIA [illegible] Sheridan [illegible] · MRS. ROBERT FRISBY [illegible] Cody 82414 · LLOYD BARTLING P.O. Box 172 Douglas 82633 · JACK D. OSMOND P.O. Box 218 Thayne 83127 · LARRY BIRLEFFI 828 E. Apache Cheyenne 82009



2-6

Mr. Dick Hartman
State Planning Coordinator
Cheyenne, Wyoming 82002

December 23, 1983

Page -2-

any effects to campgrounds and other recreation areas on federal lands caused by this project (p. 4-37). However, the Recreation Commission feels that it is not enough to simply state that monitoring will be done. The FEIS should go a step further and specify exactly how and when the monitoring is to be accomplished as well as how the program is to be funded. Otherwise, the idea of monitoring various recreation impacts may never receive consideration more serious than lip service.

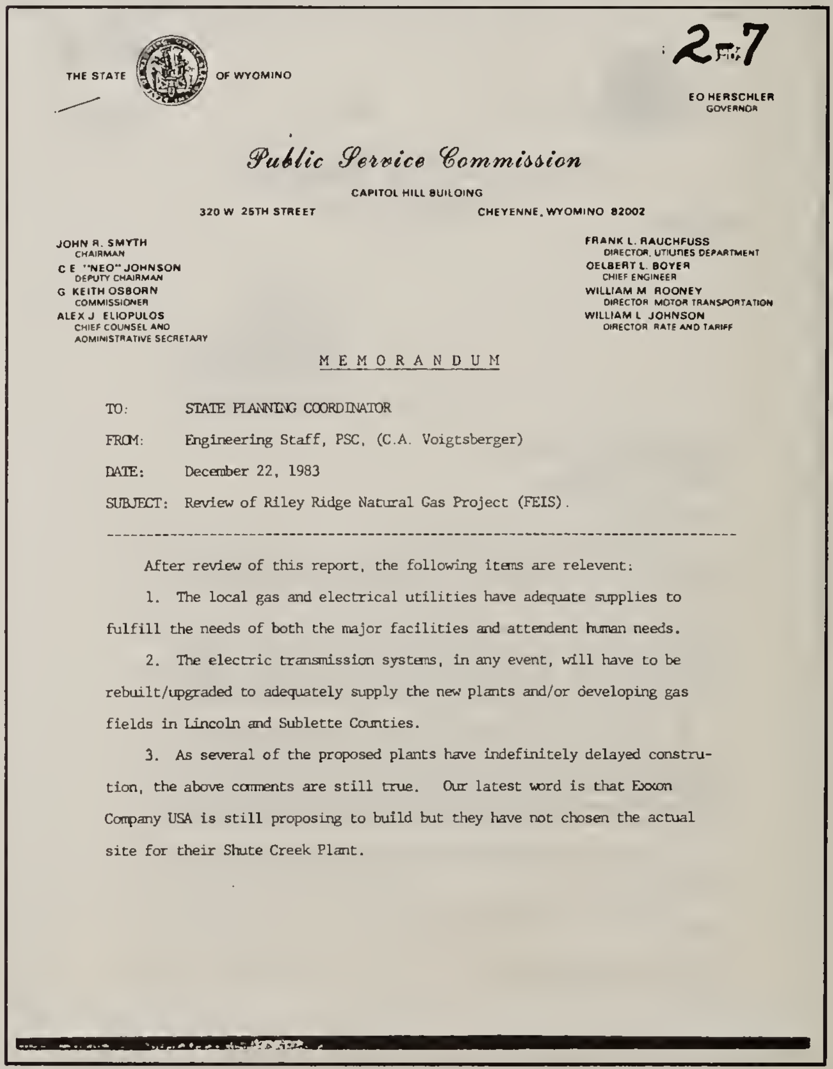
Lastly, the Recreation Commission would like to reiterate and emphasize our previous suggestion that Fontenelle Reservoir could be playing a greater role in the provision of outdoor recreation opportunities in the project area (p. 4-157, comment 27.39). The Recreation Commission feels that the various possibilities concerning funding, operation, and maintenance of recreation facilities at Fontenelle Reservoir which were outlined in our original letter have merit and deserve consideration in future permitting actions.

Sincerely,

Joe Bonds

Joe Bonds
Planning Section Head

JB:ici



2-7

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Public Service Commission

CAPITOL HILL BUILDING
320 W. 25TH STREET CHEYENNE, WYOMING 82002

JOHN R. SMYTH
CHAIRMAN
C. E. "NEO" JOHNSON
DEPUTY CHAIRMAN
G. KEITH OSBORN
COMMISSIONER
ALEX J. ELIOPULOS
CHIEF COUNSEL AND ADMINISTRATIVE SECRETARY

FRANK L. RAUCHFUSS
DIRECTOR, UTILITIES DEPARTMENT
DELBERT L. BOYER
CHIEF ENGINEER
WILLIAM M. ROONEY
DIRECTOR MOTOR TRANSPORTATION
WILLIAM L. JOHNSON
DIRECTOR RATE AND TARIFF

MEMORANDUM

TO: STATE PLANNING COORDINATOR

FROM: Engineering Staff, PSC, (C.A. Voigtsberger)

DATE: December 22, 1983

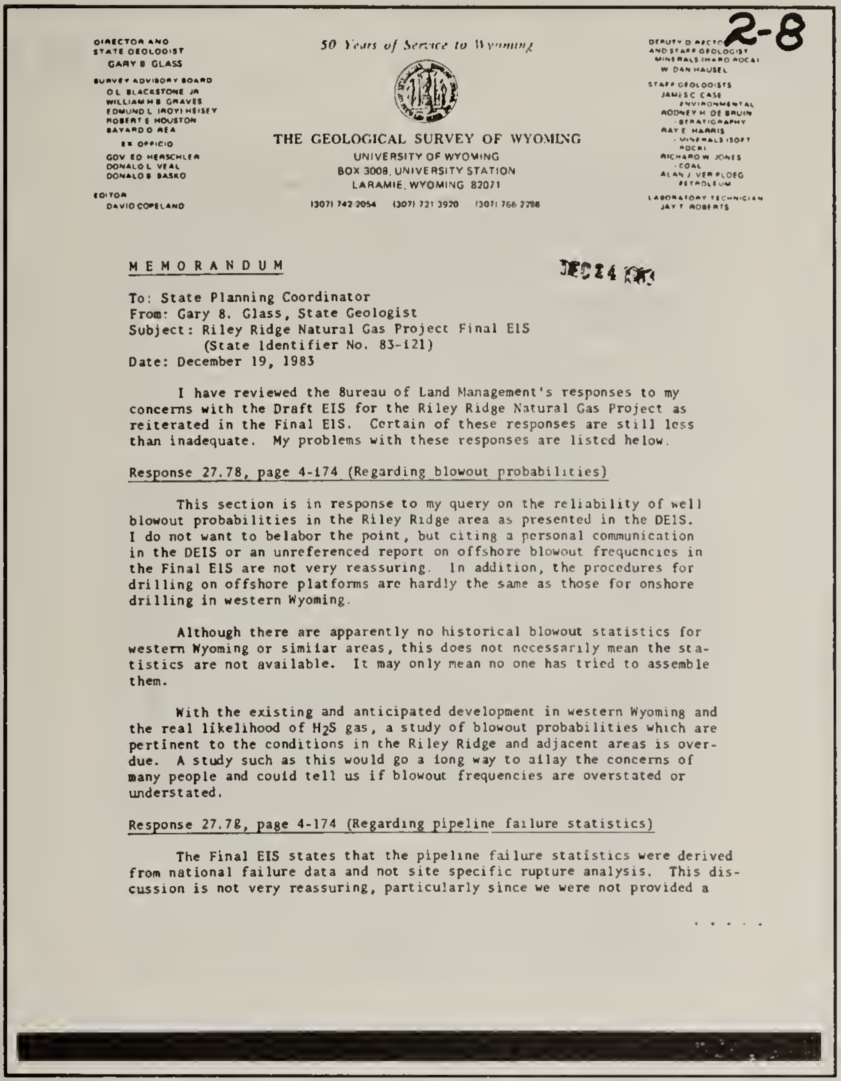
SUBJECT: Review of Riley Ridge Natural Gas Project (FEIS).

After review of this report, the following items are relevent:

1. The local gas and electrical utilities have adequate supplies to fulfill the needs of both the major facilities and attendent human needs.

2. The electric transmission systems, in any event, will have to be rebuilt/upgraded to adequately supply the new plants and/or developing gas fields in Lincoln and Sublette Counties.

3. As several of the proposed plants have indefinitely delayed construtions, the above comments are still true. Our latest word is that Exxon Company USA is still proposing to build but they have not chosen the actual site for their Shute Creek Plant.



2-8

DIRECTOR AND STATE GEOLOGIST
GARY B GLASS
SURVEY ADVISORY BOARD
D L BLACKSTONE JR
WILLIAM H B GRAVES
EDMUND L (ANDY) HEISEY
ROBERT E HOUSTON
BAYARD D REA
EX OFFICIO
GOV ED HERSCHLER
DONALD L VEAL
DONALD B BASKO
EDITOR
DAVID COPELAND

50 Years of Service to Wyoming

THE GEOLOGICAL SURVEY OF WYOMING
UNIVERSITY OF WYOMING
BOX 3008, UNIVERSITY STATION
LARAMIE, WYOMING 82071
(307) 742 2054 (307) 721 3920 (307) 766 2786

DEPUTY DIRECTOR AND STAFF GEOLOGIST
MINERALS (HARD ROCK)
W DAN HAUSEL
STAFF GEOLOGISTS
JAMES C CASE
ENVIRONMENTAL
RODNEY H DE BRUIN
STRATIGRAPHY
RAY E HARRIS
MINERALS (SOFT ROCK)
RICHARD W JONES
COAL
ALAN J VER PLOEG
PETROLEUM
LABORATORY TECHNICIAN
JAY T ROBERTS

M E M O R A N D U M

DEC 24 [illegible]

To: State Planning Coordinator
From: Gary 8. Glass, State Geologist
Subject: Riley Ridge Natural Gas Project Final EIS
(State Identifier No. 83-121)
Date: December 19, 1983

I have reviewed the 8ureau of Land Management's responses to my concerns with the Draft EIS for the Riley Ridge Natural Gas Project as reiterated in the Final EIS. Certain of these responses are still less than inadequate. My problems with these responses are listed helow.

Response 27.78, page 4-174 (Regarding blowout probabilities)

This section is in response to my query on the reliability of well blowout probabilities in the Riley Ridge area as presented in the DEIS. I do not want to belabor the point, but citing a personal communication in the DEIS or an unreferenced report on offshore blowout frequencies in the Final EIS are not very reassuring. In addition, the procedures for drilling on offshore platforms are hardly the same as those for onshore drilling in western Wyoming.

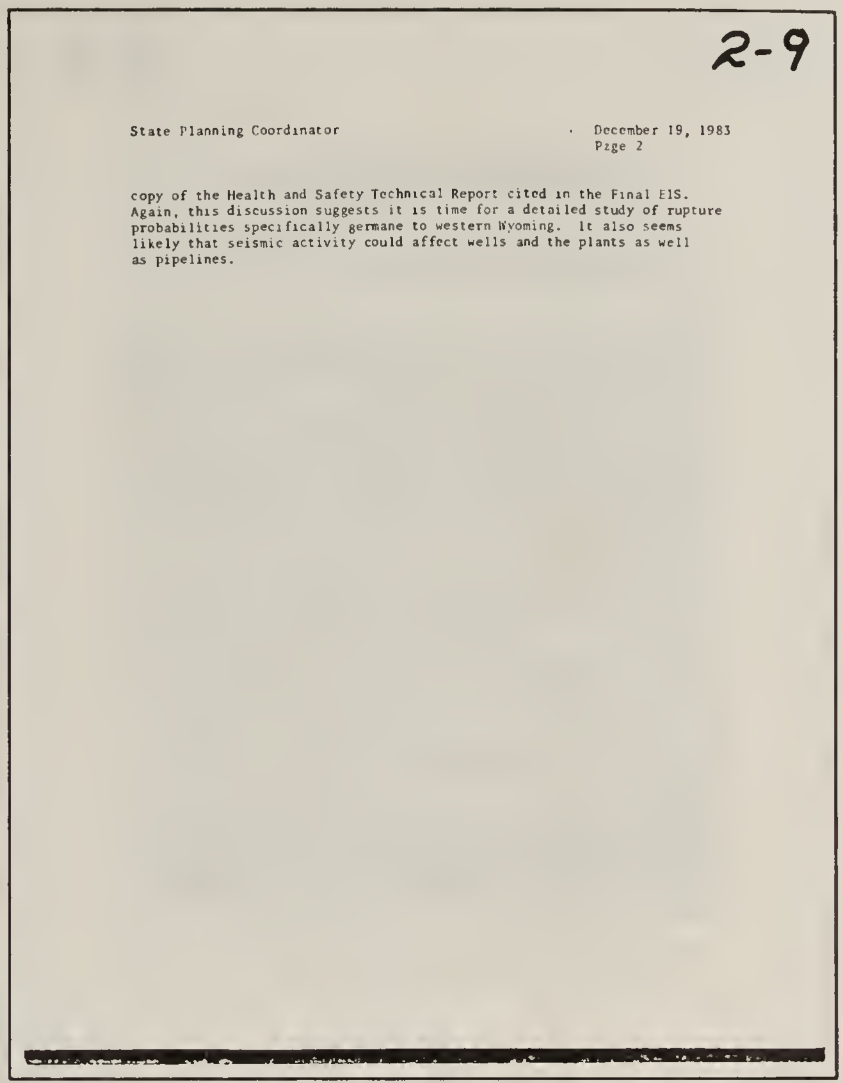
Although there are apparently no historical blowout statistics for western Wyoming or similar areas, this does not necessarily mean the statistics are not available. It may only mean no one has tried to assemble them.

With the existing and anticipated development in western Wyoming and the real likelihood of H_2S gas, a study of blowout probabilities which are pertinent to the conditions in the Riley Ridge and adjacent areas is overdue. A study such as this would go a long way to allay the concerns of many people and could tell us if blowout frequencies are overstated or understated.

Response 27.78, page 4-174 (Regarding pipeline failure statistics)

The Final EIS states that the pipeline failure statistics were derived from national failure data and not site specific rupture analysis. This discussion is not very reassuring, particularly since we were not provided a

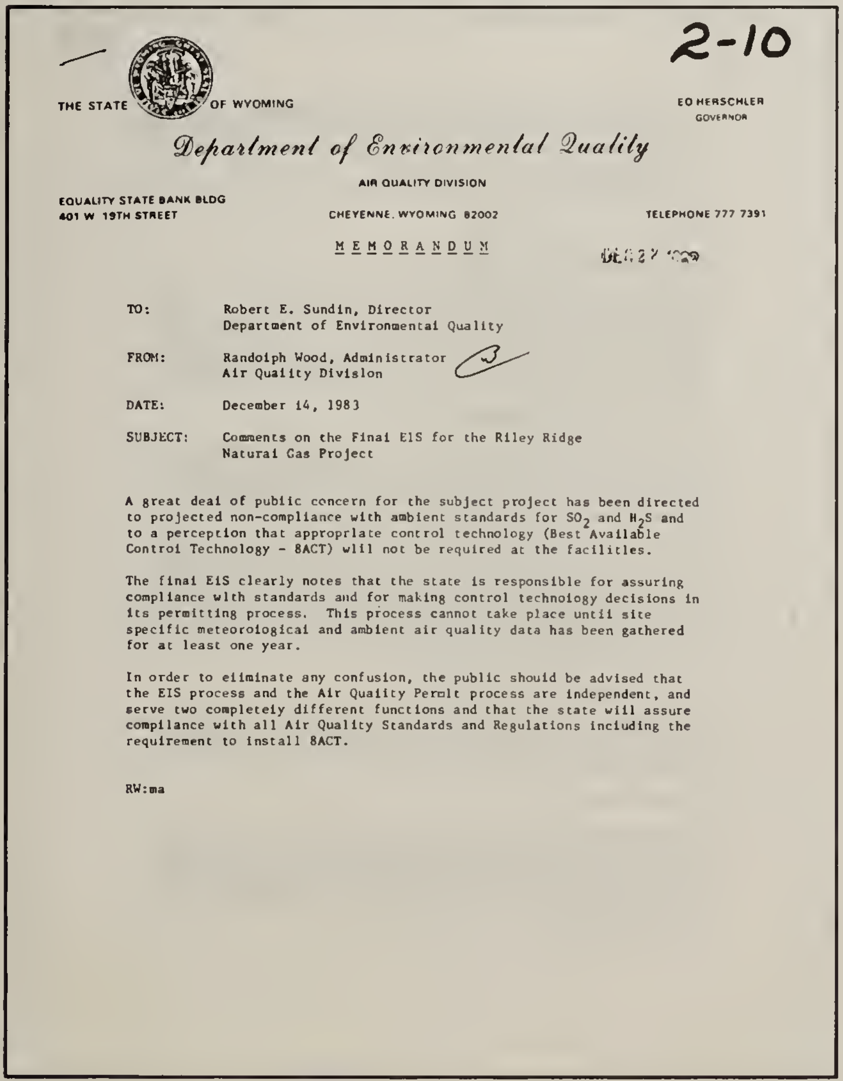
. . . . .



2-9

State Planning Coordinator
December 19, 1983
Pzge 2

copy of the Health and Safety Technical Report cited in the Final EIS. Again, this discussion suggests it is time for a detailed study of rupture probabilities specifically germane to western Wyoming. It also seems likely that seismic activity could affect wells and the plants as well as pipelines.



2-10

THE STATE OF WYOMING
ED HERSCHLER
GOVERNOR

Department of Environmental Quality

AIR QUALITY DIVISION

EQUALITY STATE BANK BLDG
401 W 19TH STREET
CHEYENNE, WYOMING 82002
TELEPHONE 777 7391

M E M O R A N D U M

[illegible]

TO: Robert E. Sundin, Director
Department of Environmental Quality

FROM: Randolph Wood, Administrator
Air Quality Division

DATE: December 14, 1983

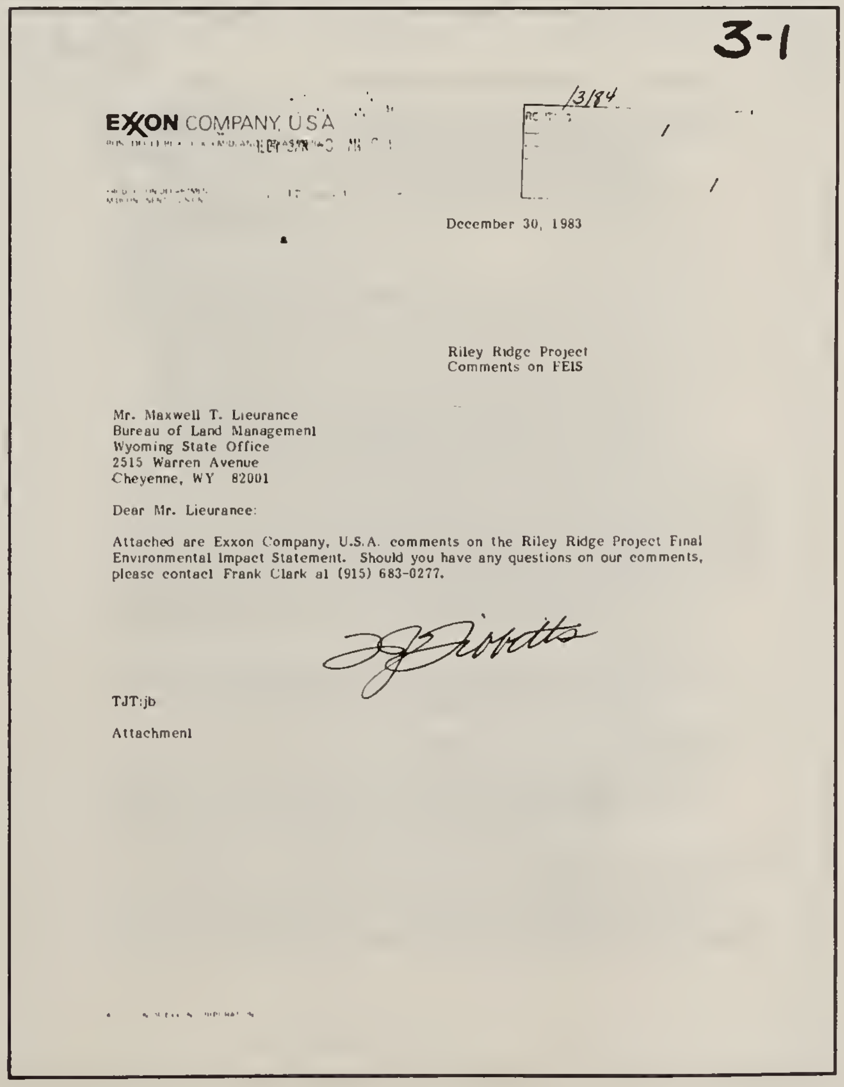
SUBJECT: Comments on the Final EIS for the Riley Ridge
Natural Gas Project

A great deal of public concern for the subject project has been directed to projected non-compliance with ambient standards for SO_2 and H_2S and to a perception that appropriate control technology (Best Available Control Technology - 8ACT) will not be required at the facilities.

The final EIS clearly notes that the state is responsible for assuring compliance with standards and for making control technology decisions in its permitting process. This process cannot take place until site specific meteorological and ambient air quality data has been gathered for at least one year.

In order to eliminate any confusion, the public should be advised that the EIS process and the Air Quality Permit process are independent, and serve two completely different functions and that the state will assure compliance with all Air Quality Standards and Regulations including the requirement to install 8ACT.

RW:ma



3-1

EXXON COMPANY, U.S.A.

/3/84

December 30, 1983

Riley Ridge Project
Comments on FEIS

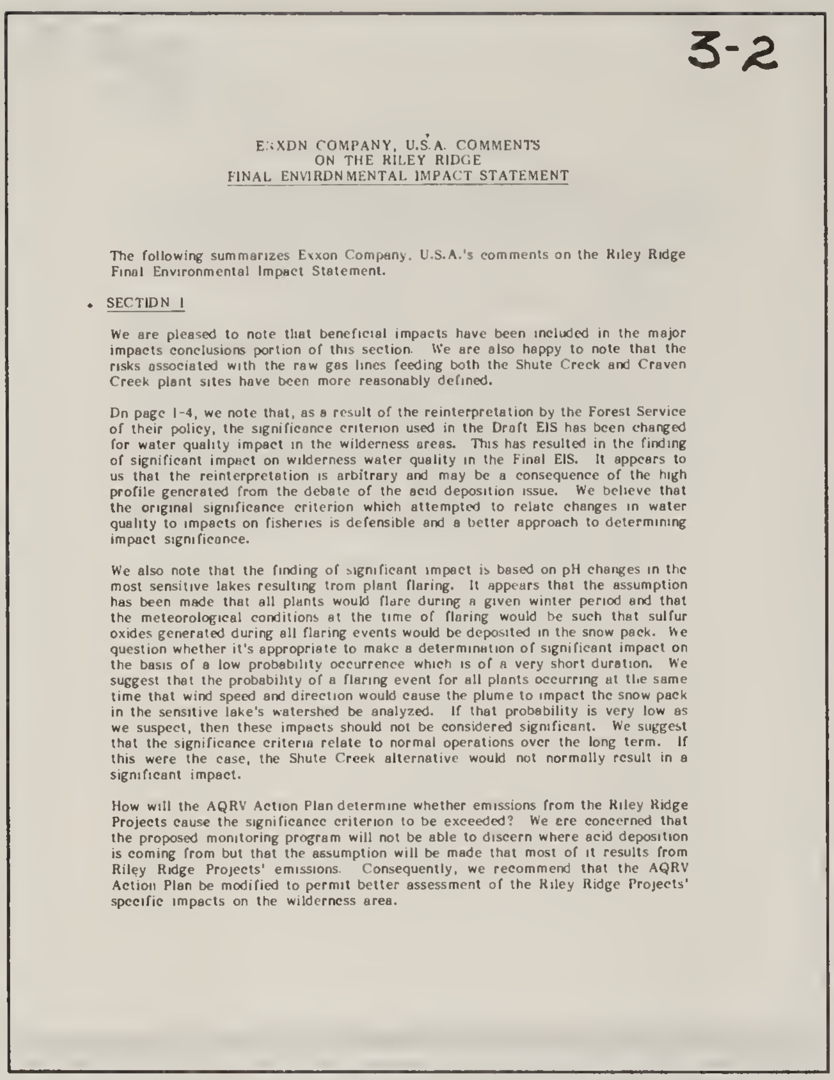
Mr. Maxwell T. Lieurance
Bureau of Land Management
Wyoming State Office
2515 Warren Avenue
Cheyenne, WY 82001

Dear Mr. Lieurance:

Attached are Exxon Company, U.S.A. comments on the Riley Ridge Project Final Environmental Impact Statement. Should you have any questions on our comments, please contact Frank Clark at (915) 683-0277.

TJT:jb

Attachment



3-2

EXXON COMPANY, U.S.A. COMMENTS
ON THE RILEY RIDGE
FINAL ENVIRONMENTAL IMPACT STATEMENT

The following summarizes Exxon Company, U.S.A.'s comments on the Riley Ridge Final Environmental Impact Statement.

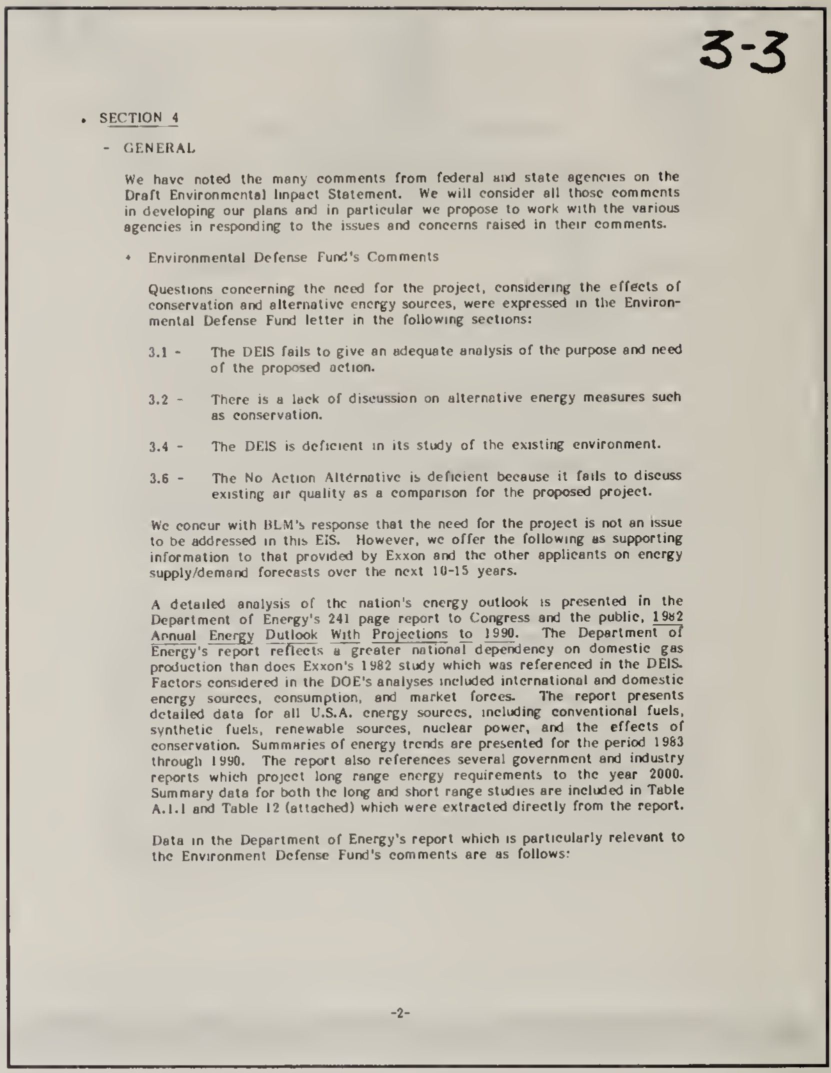
- SECTION 1

We are pleased to note that beneficial impacts have been included in the major impacts conclusions portion of this section. We are also happy to note that the risks associated with the raw gas lines feeding both the Shute Creek and Craven Creek plant sites have been more reasonably defined.

On page 1-4, we note that, as a result of the reinterpretation by the Forest Service of their policy, the significance criterion used in the Draft EIS has been changed for water quality impact in the wilderness areas. This has resulted in the finding of significant impact on wilderness water quality in the Final EIS. It appears to us that the reinterpretation is arbitrary and may be a consequence of the high profile generated from the debate of the acid deposition issue. We believe that the original significance criterion which attempted to relate changes in water quality to impacts on fisheries is defensible and a better approach to determining impact significance.

We also note that the finding of significant impact is based on pH changes in the most sensitive lakes resulting trom plant flaring. It appears that the assumption has been made that all plants would flare during a given winter period and that the meteorological conditions at the time of flaring would be such that sulfur oxides generated during all flaring events would be deposited in the snow pack. We question whether it's appropriate to make a determination of significant impact on the basis of a low probability occurrence which is of a very short duration. We suggest that the probability of a flaring event for all plants occurring at the same time that wind speed and direction would cause the plume to impact the snow pack in the sensitive lake's watershed be analyzed. If that probability is very low as we suspect, then these impacts should not be considered significant. We suggest that the significance criteria relate to normal operations over the long term. If this were the case, the Shute Creek alternative would not normally result in a significant impact.

How will the AQRV Action Plan determine whether emissions from the Riley Ridge Projects cause the significance criterion to be exceeded? We are concerned that the proposed monitoring program will not be able to discern where acid deposition is coming from but that the assumption will be made that most of it results from Riley Ridge Projects' emissions. Consequently, we recommend that the AQRV Action Plan be modified to permit better assessment of the Riley Ridge Projects' specific impacts on the wilderness area.



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- SECTION 4

  - GENERAL

We have noted the many comments from federal and state agencies on the Draft Environmental Impact Statement. We will consider all those comments in developing our plans and in particular we propose to work with the various agencies in responding to the issues and concerns raised in their comments.

- Environmental Defense Fund's Comments

Questions concerning the need for the project, considering the effects of conservation and alternative energy sources, were expressed in the Environmental Defense Fund letter in the following sections:

3.1 - The DEIS fails to give an adequate analysis of the purpose and need of the proposed action.

3.2 - There is a lack of discussion on alternative energy measures such as conservation.

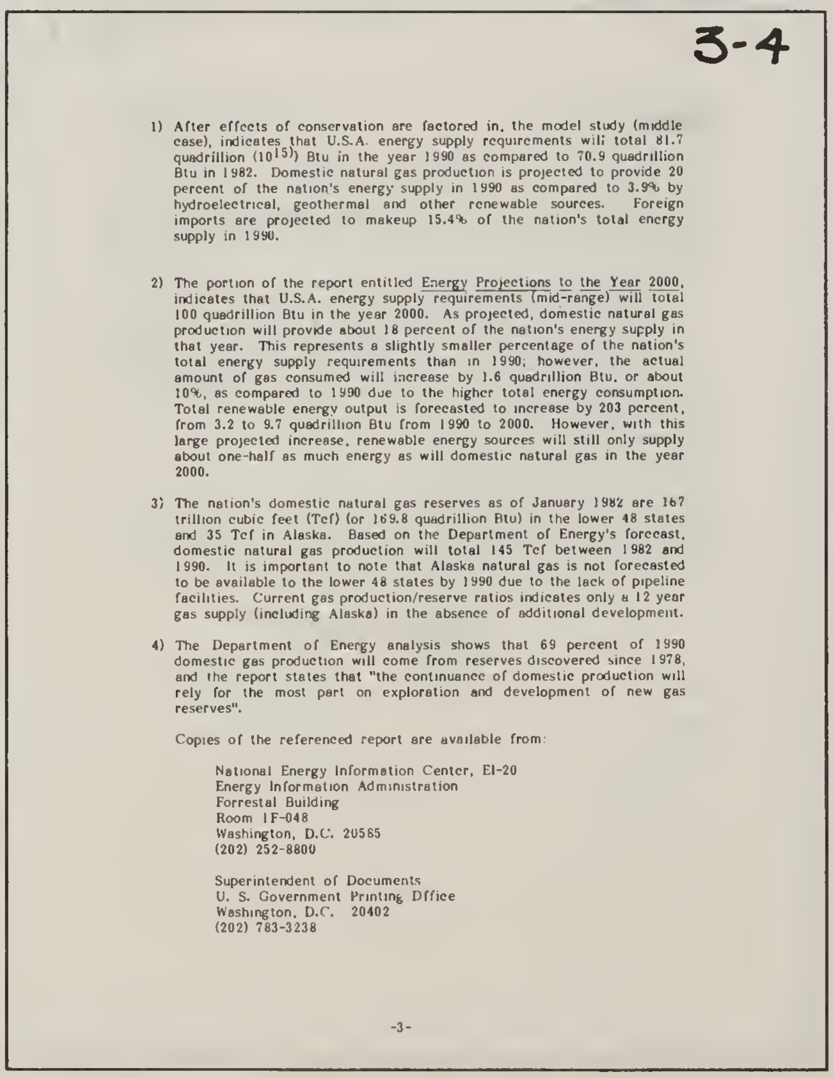
3.4 - The DEIS is deficient in its study of the existing environment.

3.6 - The No Action Alternative is deficient because it fails to discuss existing air quality as a comparison for the proposed project.

We concur with BLM's response that the need for the project is not an issue to be addressed in this EIS. However, we offer the following as supporting information to that provided by Exxon and the other applicants on energy supply/demand forecasts over the next 10-15 years.

A detailed analysis of the nation's energy outlook is presented in the Department of Energy's 241 page report to Congress and the public, 1982 Annual Energy Outlook With Projections to 1990. The Department of Energy's report reflects a greater national dependency on domestic gas production than does Exxon's 1982 study which was referenced in the DEIS. Factors considered in the DOE's analyses included international and domestic energy sources, consumption, and market forces. The report presents detailed data for all U.S.A. energy sources, including conventional fuels, synthetic fuels, renewable sources, nuclear power, and the effects of conservation. Summaries of energy trends are presented for the period 1983 through 1990. The report also references several government and industry reports which project long range energy requirements to the year 2000. Summary data for both the long and short range studies are included in Table A.1.1 and Table 12 (attached) which were extracted directly from the report.

Data in the Department of Energy's report which is particularly relevant to the Environment Defense Fund's comments are as follows:



3-4

1) After effects of conservation are factored in, the model study (middle case), indicates that U.S.A. energy supply requirements will total 81.7 quadrillion (10^{15}) Btu in the year 1990 as compared to 70.9 quadrillion Btu in 1982. Domestic natural gas production is projected to provide 20 percent of the nation's energy supply in 1990 as compared to 3.9% by hydroelectrical, geothermal and other renewable sources. Foreign imports are projected to makeup 15.4% of the nation's total energy supply in 1990.

2) The portion of the report entitled Energy Projections to the Year 2000, indicates that U.S.A. energy supply requirements (mid-range) will total 100 quadrillion Btu in the year 2000. As projected, domestic natural gas production will provide about 18 percent of the nation's energy supply in that year. This represents a slightly smaller percentage of the nation's total energy supply requirements than in 1990; however, the actual amount of gas consumed will increase by 1.6 quadrillion Btu, or about 10%, as compared to 1990 due to the higher total energy consumption. Total renewable energy output is forecasted to increase by 203 percent, from 3.2 to 9.7 quadrillion Btu from 1990 to 2000. However, with this large projected increase, renewable energy sources will still only supply about one-half as much energy as will domestic natural gas in the year 2000.

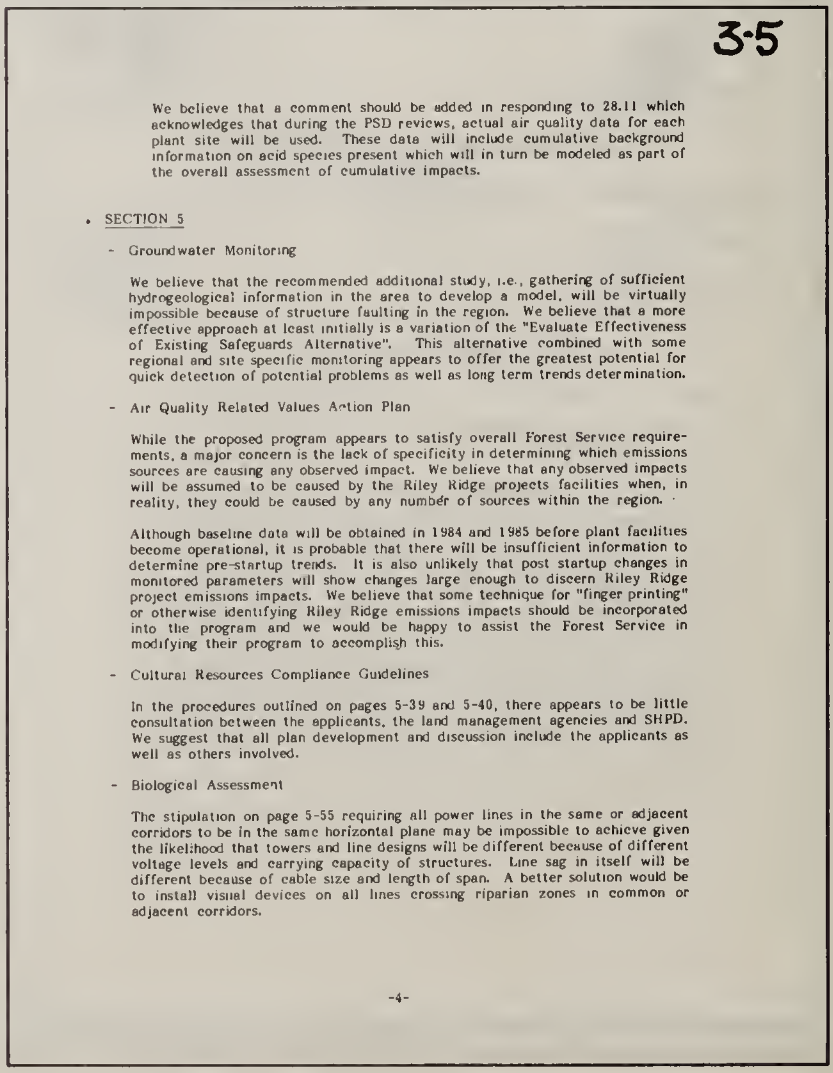
3) The nation's domestic natural gas reserves as of January 1982 are 167 trillion cubic feet (Tcf) (or 169.8 quadrillion Btu) in the lower 48 states and 35 Tcf in Alaska. Based on the Department of Energy's forecast, domestic natural gas production will total 145 Tcf between 1982 and 1990. It is important to note that Alaska natural gas is not forecasted to be available to the lower 48 states by 1990 due to the lack of pipeline facilities. Current gas production/reserve ratios indicates only a 12 year gas supply (including Alaska) in the absence of additional development.

4) The Department of Energy analysis shows that 69 percent of 1990 domestic gas production will come from reserves discovered since 1978, and the report states that "the continuance of domestic production will rely for the most part on exploration and development of new gas reserves".

Copies of the referenced report are available from:

National Energy Information Center, EI-20
Energy Information Administration
Forrestal Building
Room 1F-048
Washington, D.C. 20585
(202) 252-8800

Superintendent of Documents
U. S. Government Printing Office
Washington, D.C. 20402
(202) 783-3238



3-5

We believe that a comment should be added in responding to 28.11 which acknowledges that during the PSD reviews, actual air quality data for each plant site will be used. These data will include cumulative background information on acid species present which will in turn be modeled as part of the overall assessment of cumulative impacts.

- SECTION 5

  - Groundwater Monitoring

We believe that the recommended additional study, i.e., gathering of sufficient hydrogeological information in the area to develop a model, will be virtually impossible because of structure faulting in the region. We believe that a more effective approach at least initially is a variation of the "Evaluate Effectiveness of Existing Safeguards Alternative". This alternative combined with some regional and site specific monitoring appears to offer the greatest potential for quick detection of potential problems as well as long term trends determination.

  - Air Quality Related Values Action Plan

While the proposed program appears to satisfy overall Forest Service requirements, a major concern is the lack of specificity in determining which emissions sources are causing any observed impact. We believe that any observed impacts will be assumed to be caused by the Riley Ridge projects facilities when, in reality, they could be caused by any number of sources within the region.

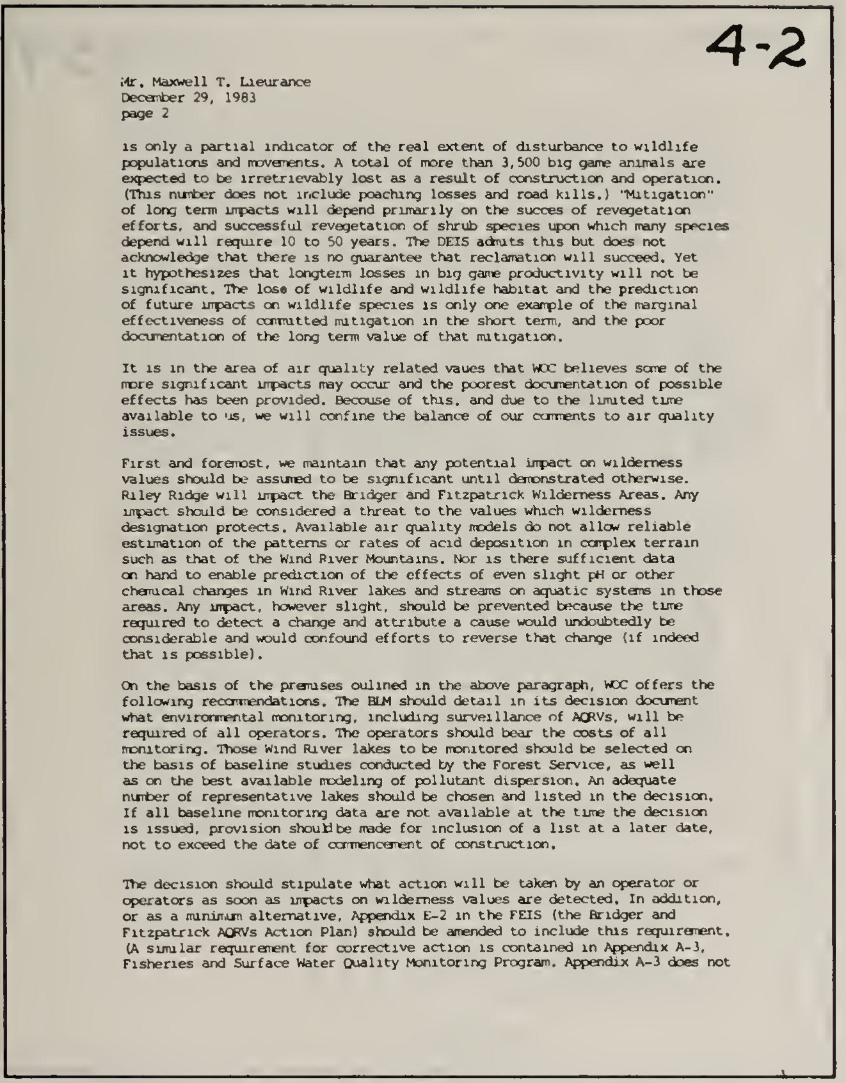
Although baseline data will be obtained in 1984 and 1985 before plant facilities become operational, it is probable that there will be insufficient information to determine pre-startup trends. It is also unlikely that post startup changes in monitored parameters will show changes large enough to discern Riley Ridge project emissions impacts. We believe that some technique for "finger printing" or otherwise identifying Riley Ridge emissions impacts should be incorporated into the program and we would be happy to assist the Forest Service in modifying their program to accomplish this.

  - Cultural Resources Compliance Guidelines

In the procedures outlined on pages 5-39 and 5-40, there appears to be little consultation between the applicants, the land management agencies and SHPD. We suggest that all plan development and discussion include the applicants as well as others involved.

  - Biological Assessment

The stipulation on page 5-55 requiring all power lines in the same or adjacent corridors to be in the same horizontal plane may be impossible to achieve given the likelihood that towers and line designs will be different because of different voltage levels and carrying capacity of structures. Line sag in itself will be different because of cable size and length of span. A better solution would be to install visual devices on all lines crossing riparian zones in common or adjacent corridors.



4-2

Mr. Maxwell T. Lieurance
December 29, 1983
page 2

is only a partial indicator of the real extent of disturbance to wildlife populations and movements. A total of more than 3,500 big game animals are expected to be irretrievably lost as a result of construction and operation. (This number does not include poaching losses and road kills.) "Mitigation" of long term impacts will depend primarily on the succes of revegetation efforts, and successful revegetation of shrub species upon which many species depend will require 10 to 50 years. The DEIS admits this but does not acknowledge that there is no guarantee that reclamation will succeed. Yet it hypothesizes that longterm losses in big game productivity will not be significant. The lose of wildlife and wildlife habitat and the prediction of future impacts on wildlife species is only one example of the marginal effectiveness of committed mitigation in the short term, and the poor documentation of the long term value of that mitigation.

It is in the area of air quality related vaues that WOC believes some of the more significant impacts may occur and the poorest documentation of possible effects has been provided. Becouse of this, and due to the limited time available to us, we will confine the balance of our comments to air quality issues.

First and foremost, we maintain that any potential impact on wilderness values should be assumed to be significant until demonstrated otherwise. Riley Ridge will impact the Bridger and Fitzpatrick Wilderness Areas. Any impact should be considered a threat to the values which wilderness designation protects. Available air quality models do not allow reliable estimation of the patterns or rates of acid deposition in complex terrain such as that of the Wind River Mountains. Nor is there sufficient data on hand to enable prediction of the effects of even slight pH or other chemical changes in Wind River lakes and streams on aquatic systems in those areas. Any impact, however slight, should be prevented because the time required to detect a change and attribute a cause would undoubtedly be considerable and would confound efforts to reverse that change (if indeed that is possible).

On the basis of the premises oulined in the above paragraph, WOC offers the following recommendations. The BLM should detail in its decision document what environmental monitoring, including surveillance of AQRVs, will be required of all operators. The operators should bear the costs of all monitoring. Those Wind River lakes to be monitored should be selected on the basis of baseline studies conducted by the Forest Service, as well as on the best available modeling of pollutant dispersion. An adequate number of representative lakes should be chosen and listed in the decision. If all baseline monitoring data are not available at the time the decision is issued, provision shouldbe made for inclusion of a list at a later date, not to exceed the date of commencement of construction.

The decision should stipulate what action will be taken by an operator or operators as soon as impacts on wilderness values are detected. In addition, or as a minimum alternative, Appendix E-2 in the FEIS (the Bridger and Fitzpatrick AQRVs Action Plan) should be amended to include this requirement. (A similar requirement for corrective action is contained in Appendix A-3, Fisheries and Surface Water Quality Monitoring Program. Appendix A-3 does not

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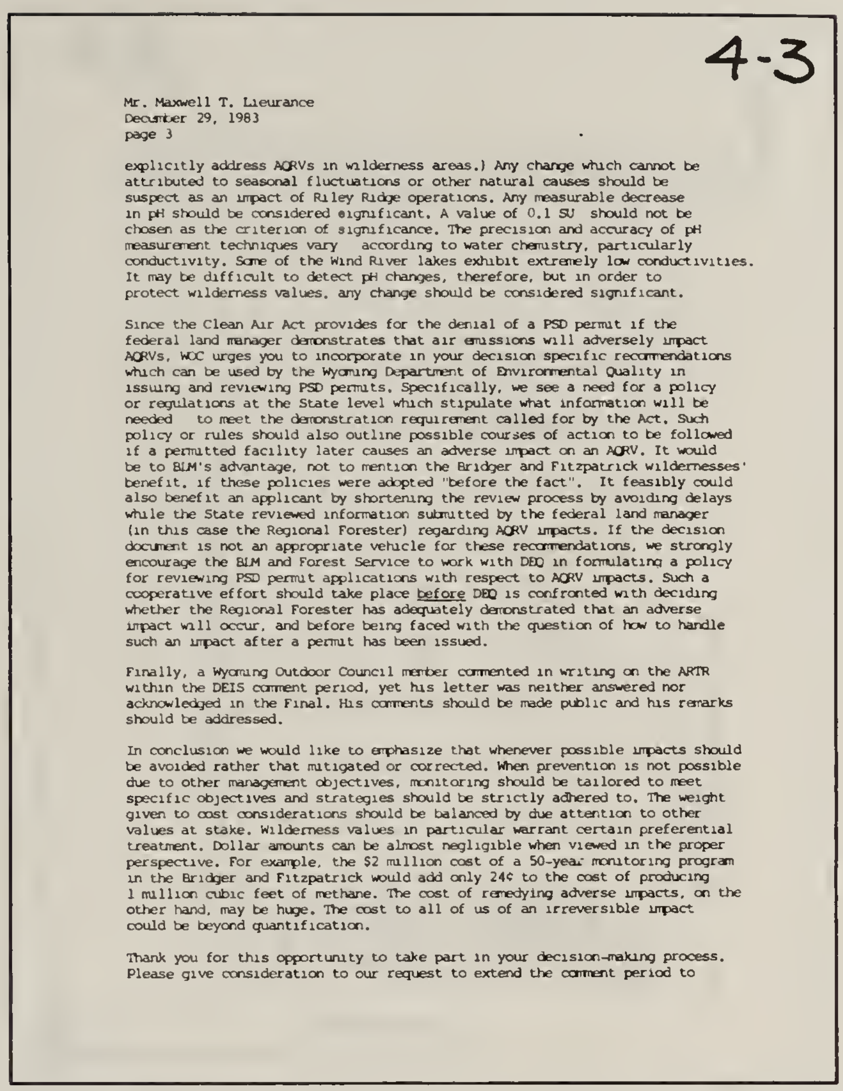

4-3

Mr. Maxwell T. Lieurance
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page 3

explicitly address AQRVs in wilderness areas.) Any change which cannot be attributed to seasonal fluctuations or other natural causes should be suspect as an impact of Riley Ridge operations. Any measurable decrease in pH should be considered significant. A value of 0.1 SU should not be chosen as the criterion of significance. The precision and accuracy of pH measurement techniques vary according to water chemistry, particularly conductivity. Some of the Wind River lakes exhibit extremely low conductivities. It may be difficult to detect pH changes, therefore, but in order to protect wilderness values, any change should be considered significant.

Since the Clean Air Act provides for the denial of a PSD permit if the federal land manager demonstrates that air emissions will adversely impact AQRVs, WOC urges you to incorporate in your decision specific recommendations which can be used by the Wyoming Department of Environmental Quality in issuing and reviewing PSD permits. Specifically, we see a need for a policy or regulations at the State level which stipulate what information will be needed to meet the demonstration requirement called for by the Act. Such policy or rules should also outline possible courses of action to be followed if a permitted facility later causes an adverse impact on an AQRV. It would be to BLM's advantage, not to mention the Bridger and Fitzpatrick wildernesses' benefit, if these policies were adopted "before the fact". It feasibly could also benefit an applicant by shortening the review process by avoiding delays while the State reviewed information submitted by the federal land manager (in this case the Regional Forester) regarding AQRV impacts. If the decision document is not an appropriate vehicle for these recommendations, we strongly encourage the BLM and Forest Service to work with DEQ in formulating a policy for reviewing PSD permit applications with respect to AQRV impacts. Such a cooperative effort should take place before DEQ is confronted with deciding whether the Regional Forester has adequately demonstrated that an adverse impact will occur, and before being faced with the question of how to handle such an impact after a permit has been issued.

Finally, a Wyoming Outdoor Council member commented in writing on the ARTR within the DEIS comment period, yet his letter was neither answered nor acknowledged in the Final. His comments should be made public and his remarks should be addressed.

In conclusion we would like to emphasize that whenever possible impacts should be avoided rather that mitigated or corrected. When prevention is not possible due to other management objectives, monitoring should be tailored to meet specific objectives and strategies should be strictly adhered to. The weight given to cost considerations should be balanced by due attention to other values at stake. Wilderness values in particular warrant certain preferential treatment. Dollar amounts can be almost negligible when viewed in the proper perspective. For example, the $2 million cost of a 50-year monitoring program in the Bridger and Fitzpatrick would add only 24¢ to the cost of producing 1 million cubic feet of methane. The cost of remedying adverse impacts, on the other hand, may be huge. The cost to all of us of an irreversible impact could be beyond quantification.

Thank you for this opportunity to take part in your decision-making process. Please give consideration to our request to extend the comment period to

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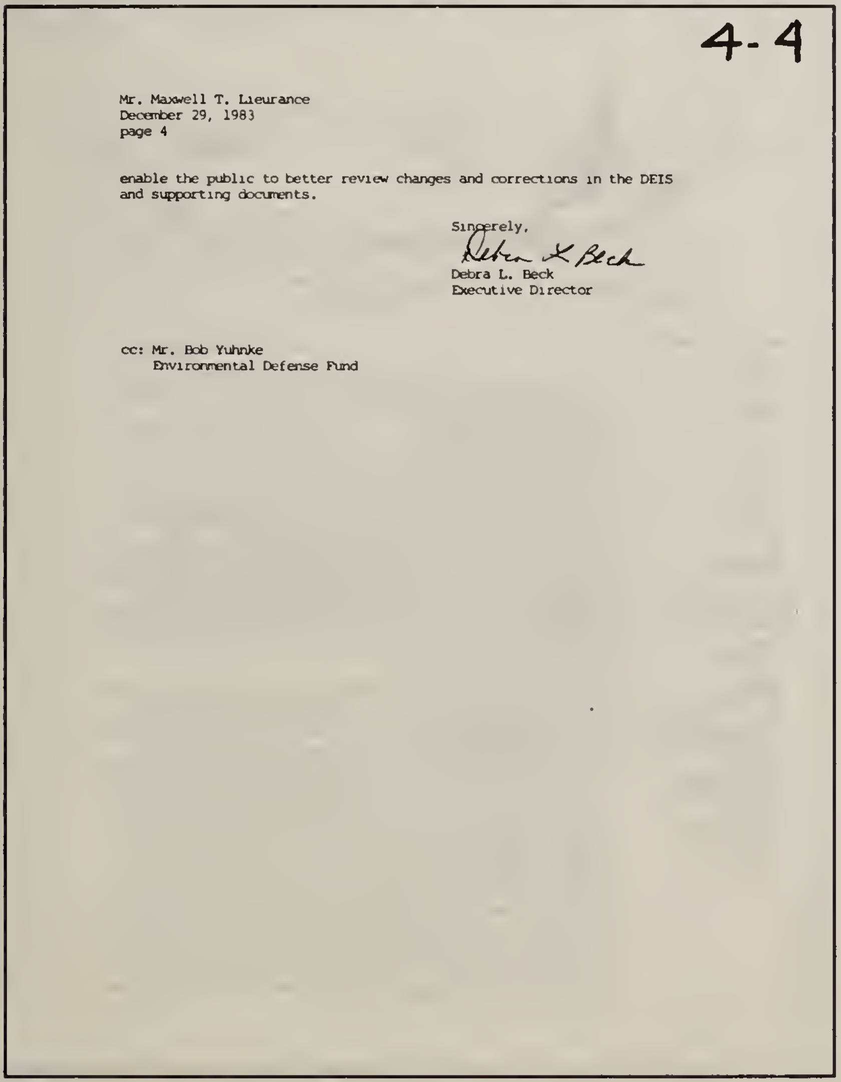

4-4

Mr. Maxwell T. Lieurance
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page 4

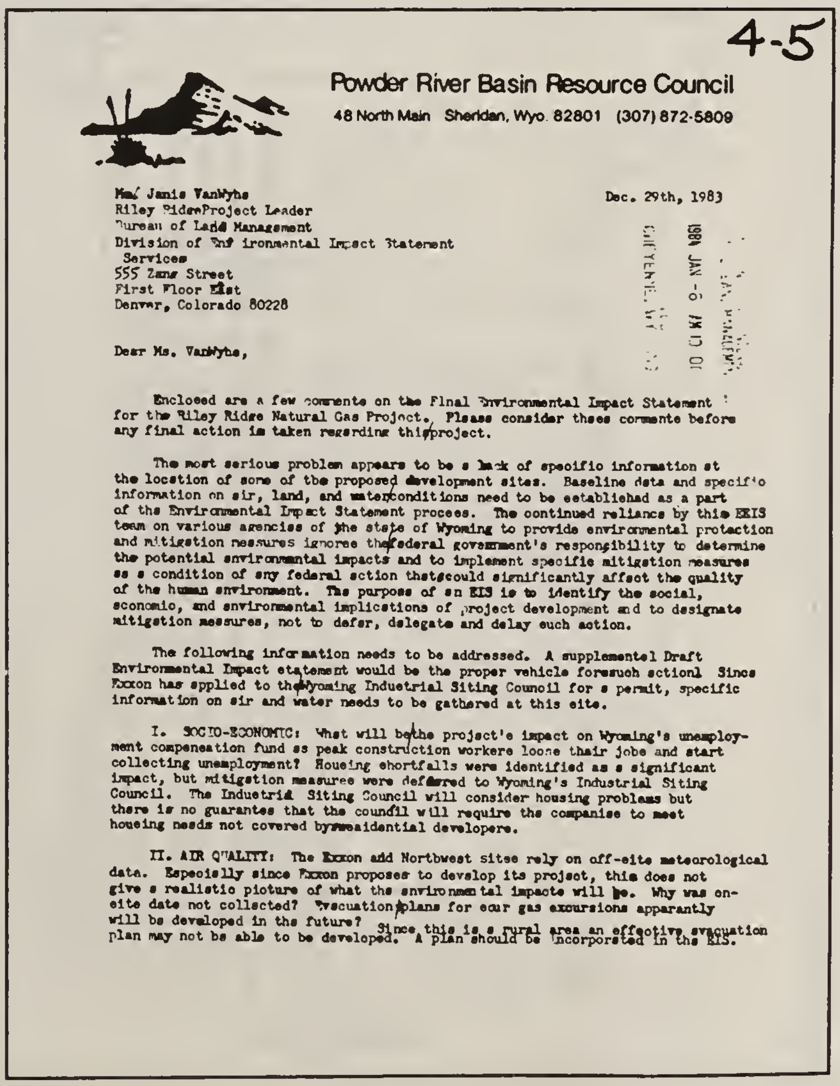
enable the public to better review changes and corrections in the DEIS and supporting documents.

Sincerely,

Debra L. Beck

Debra L. Beck
Executive Director

cc: Mr. Bob Yuhnke
Environmental Defense Fund



4-5

Powder River Basin Resource Council
48 North Main Sheridan, Wyo. 82801 (307) 872-5809

Dec. 29th, 1983

Ms. Janis VanWyhe
Riley Ridge Project Leader
Bureau of Land Management
Division of Environmental Impact Statement
Services
555 Zang Street
First Floor East
Denver, Colorado 80228

CHEYENNE, WY
1984 JAN -6 AM 10 01

Dear Ms. VanWyhe,

Enclosed are a few comments on the Final Environmental Impact Statement for the Riley Ridge Natural Gas Project. Please consider these comments before any final action is taken regarding this project.

The most serious problem appears to be a lack of specific information at the location of some of the proposed development sites. Baseline data and specific information on air, land, and water conditions need to be established as a part of the Environmental Impact Statement process. The continued reliance by this EIS team on various agencies of the state of Wyoming to provide environmental protection and mitigation measures ignores the federal government's responsibility to determine the potential environmental impacts and to implement specific mitigation measures as a condition of any federal action that could significantly affect the quality of the human environment. The purpose of an EIS is to identify the social, economic, and environmental implications of project development and to designate mitigation measures, not to defer, delegate and delay such action.

The following information needs to be addressed. A supplemental Draft Environmental Impact statement would be the proper vehicle for such action. Since Exxon has applied to the Wyoming Industrial Siting Council for a permit, specific information on air and water needs to be gathered at this site.

I. SOCIO-ECONOMIC: What will be the project's impact on Wyoming's unemployment compensation fund as peak construction workers loose their jobs and start collecting unemployment? Housing shortfalls were identified as a significant impact, but mitigation measures were deferred to Wyoming's Industrial Siting Council. The Industrial Siting Council will consider housing problems but there is no guarantee that the council will require the companies to meet housing needs not covered by residential developers.

II. AIR QUALITY: The Exxon and Northwest sites rely on off-site meteorological data. Especially since Exxon proposes to develop its project, this does not give a realistic picture of what the environmental impacts will be. Why was on-site data not collected? Evacuation plans for sour gas excursions apparently will be developed in the future? Since this is a rural area an effective evacuation plan may not be able to be developed. A plan should be incorporated in the EIS.

3-6

Case A

TABLE A.1.1. YEARLY SUPPLY AND DISPOSITION OF TOTAL ENERGY
CASE A: MIDDLE WORLD OIL PRICE
(QUADRILLION BTU PER YEAR)

	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
SUPPLY												
PRODUCTION												
PETROLEUM..........	20.7	20.5	20.4	20.8	20.5	20.6	20.4	20.5	20.5	20.5	20.3	19.5
NATURAL GAS........	19.4	20.1	19.9	18.2	17.3	17.8	15.2	14.7	14.8	13.5	13.9	16.4
COAL	15.2	19.2	19.1	19.1	19.4	19.4	20.3	20.8	21.4	22.8	22.8	23.9
NUCLEAR	1.9	2.7	2.9	3.8	3.2	3.7	4.1	4.7	5.3	5.8	6.1	6.3
HYDRO/GEO/OTHER....	3.2	3.0	2.9	3.3	3.2	3.1	3.1	3.1	3.2	3.2	3.2	3.2
SUBTOTAL..........	40.1	43.5	45.2	44.2	63.7	43.9	45.2	43.9	43.0	46.8	48.2	49.1
NET IMPORTS												
CRUDE OIL..........	8.7	10.4	8.8	4.8	7.5	10.4	13.0	12.7	12.8	11.4	11.8	11.9
OTHER PETROLEUM....	3.8	2.9	2.6	2.1	2.3	3.8	5.1	3.1	3.1	3.1	3.1	3.2
NG (CONTRACTED)(1).	0.9	1.0	.9	.9	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
OTHER GAS(2).......	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.0
COAL AND COKE......	-1.7	-2.4	-2.9	-2.8	-2.4	-2.7	-2.9	-3.0	-5.2	-3.4	-3.4	-3.8
ELECTRICITY........	0.1	.2	.2	.2	.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4
SUBTOTAL..........	11.7	12.3	9.4	7.3	8.6	12.3	14.0	14.4	13.7	12.7	12.2	12.9
SPR ADDITIONS(3)....	0.0	-.1	-.7	-.4	-.4	-0.5	-0.3	-0.5	-0.5	-0.3	-0.3	-0.5
STOCK WITHDRAWALS...	-1.1	-1.0	0.0	-.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL SUPPLY.........	70.7	75.9	74.1	70.9	71.9	75.8	77.8	78.2	78.4	79.2	80.1	81.7
CONSUMPTION												
NON-ELEC UTILITY FUEL												
PETROLEUM..........	29.5	31.5	29.9	28.4	29.2	30.7	32.1	31.8	31.2	30.4	30.3	30.5
NATURAL GAS(4).....	14.7	14.8	16.1	13.0	14.9	14.5	13.7	13.3	15.5	13.7	13.9	14.1
COAL	4.0	3.4	3.4	5.8	2.9	3.2	5.3	3.3	3.4	3.5	3.7	3.8
SUBTOTAL..........	50.2	51.4	49.4	44.4	47.8	48.4	49.8	48.4	48.1	47.8	47.8	48.2
ELECTRIC UTILITY FUEL												
PETROLEUM..........	3.2	2.7	2.2	1.8	1.5	2.9	4.1	4.2	4.2	4.2	4.0	4.0
NATURAL GAS........	3.2	3.8	3.8	3.3	3.4	2.7	1.7	1.7	1.7	1.9	2.2	2.4
COAL..	8.8	12.1	12.7	12.7	13.2	13.5	14.2	14.5	14.8	13.1	13.6	14.3
NUCLEAR............	1.9	2.7	2.9	3.0	3.2	3.7	4.1	4.7	5.3	5.8	4.1	4.5
HYDRO/GEO/OTHER(5).	3.4	3.2	3.1	3.5	3.4	3.4	3.5	3.5	3.3	3.5	3.5	3.6
SUBTOTAL..........	20.5	24.5	24.7	24.3	24.7	24.0	27.2	28.5	29.1	30.1	31.0	32.2
TOTAL CONSUMPTION....	70.7	75.9	74.1	70.7	71.7	74.4	78.3	74.9	77.2	78.0	78.9	80.4
ADJUSTMENTS												
REFINERY LOSSES(6).	0.0	0.0	0.0	0.0	-0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.2
DISCREPANCY(7).....	0.0	0.0	0.0	0.2	0.5	1.4	1.1	1.1	1.0	1.0	1.0	1.1
TOTAL DISPOSITION....	70.7	75.9	74.1	70.9	71.9	75.8	77.8	78.2	78.4	79.2	80.1	81.7

NOTE: THE "ANNUAL ENERGY REVIEW" FOR 1982 WILL CONTAIN LATER REVISIONS TO HISTORICAL DATA FOR 1975, 1980 AND 1982.
NOTE: TOTALS MAY NOT EQUAL SUM OF COMPONENTS DUE TO INDEPENDENT ROUNDING. FOR TABLE FOOTNOTES AND SOURCES SEE PAGE 218.

3-7

Table 12. U.S. Energy Production and Net Imports for the Year 2000
(Quadrillion Btu)

Sector	1980[d]	NEPP[a] Midrange	NEPP[a] Range	ARC[b] Low	ARC[b] Mid	ARC[b] High	DRI[e]	EPRI[c] YYY	EPRI[c] NNN
Oil and NGL	20.5	17.5	14.0 - 23.2	19.8	19.8	19.8	17.4	15.9	17.1
Synthetic Liquids									
Shale[f]	--	2.3	1.3 - 3.4	1.7	1.7	1.7	0.	1.6	0.1
Coal-derived[f]	--	2.3	1.3 - 3.6	1.5	1.5	1.5	0.3	8.1	2.0
Biomass[f]	--	--	--	0.8	0.8	0.8	--	--	--
Synthetic Gas[f]	--	1.4	1.0 - 2.0	0.1	0.1	0.2	0.4	3.9	0.5
Natural Gas	20.1	18.0	14.7 - 21.4	17.3	17.6	17.6	15.5	18.3	17.7
Coal	19.2	41.7	37.1 - 45.9	38.5	40.5	43.0	35.9	51.4	38.5
Nuclear	2.7	10.6	7.4 - 14.0	9.1	10.5	11.6	7.4	3.9	3.9
Renewables	[g]5.2	9.7	7.6 - 11.9	10.5	10.6	10.8	4.2	--	--
Total Domestic Production .	67.7	99.8	83.0 -116.0	96.9	100.7	104.5	80.9	--	--
Net Imports									
Oil	13.5	2.5	0.0 - 11.0	6.8	8.3	10.8	14.1	7.4	13.9
Gas	1.0	2.0	1.0 - 3.1	0.5	0.6	1.1	2.8	1.5	1.1
Coal and Hydro	-2.2	-5.9	-3.4 - -8.4	-5.6	-5.6	-5.6	-4.8	--	--
Total Net Imports	12.3	0.0	NA	1.7	3.3	6.3	12.1	--	--
Adjustments	-1.9	--	--	NA	NA	NA	--	--	--
Total Domestic Supply	78.1	100.0	90.0 -110.0	98.6	104.0	110.8	92.9	--	--

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3-8

Table 12. U.S. Energy Production and Net Imports for the Year 2000 (continued)
(Quadrillion Btu)

Sector	1980[1]	NEPP Midrange	NEPP Range	ARC Low	ARC Mid	ARC High	ORI	EPRI YYY	EPRI NNN
Conventional Oil									
Lower-48 States	14.8	8.9	7.2 - 12.7	11.7*	11.7*	11.7*	9.5	15.9	17.1
Alaska	3.4	3.8	3.0 - 4.2	4.5*	4.5*	4.5*	3.1		
Natural Gas Liquids	2.2	1.0	1.3 - 1.7	*	*	*	1.2		
Enhanced Oil Recovery	**	3.8	3.0 - 5.1	3.6	3.6	3.6	3.6		
Shale Oil	-	2.3	1.3 - 3.4	1.7	1.7	1.7	0.5	1.6	0.1
Synthetics									
Coal Liquids	-	2.3	1.3 - 3.6	1.5	1.5	1.5	0.3	8.1	2.0
Liquids from Biomass	-	-	-	0.8	0.8	0.8	-	-	-
Total Domestic Production .	20.5	22.2	19.5 - 26.6	23.8	23.8	23.8	18.2	25.7	19.2
Net Oil Imports	13.5	2.5	0.0 - 11.0	6.8	8.3	10.8	14.1	7.4	13.9
Total Liquid Supplies	34.0	24.7	24.0 - 28.0	30.6	32.0	34.5	32.4	33.1	33.1

*Conventional oil and natural gas liquids are combined.
**Included in conventional oil.
Note: Totals may not add due to rounding and/or fuel conversion factors us

[a] U.S. Department of Energy, Office of Policy, Planning, and Analysis, Energy Projections to the Year 2000, DOE/PE-0029 (Washington, D.C., 1982).

[b] Energy Information Administration, 1981 Annual Report to Congress, Volume 3, DOE/EIA-0173/81)3 (Washington, D.C., 1982).

[c] Decision Focus Incorporated, Integrated Forecasting Model Synthetic Fuels Study, Volume I, Overview and Findings, (Palo Alto, California: Electric Power Research Institute, 1982).

[d] Energy Information Administration, 1981 Annual Report to Congress, Volume 2, DOE/EIA-0173(81)2 Washington, D.C., 1982).

[e] Data Resource Incorporated, Data Resources Energy Review, Autumn (Cambridge, Massachusetts, 1982).

[f] These categories are shown for informational purposes, but are not included in the total. Fuels used by these processes are already included in the other fuel categories. Low and medium Btu coal gas is not included in this category for the Annual Report forecast but is for the other forecasts.

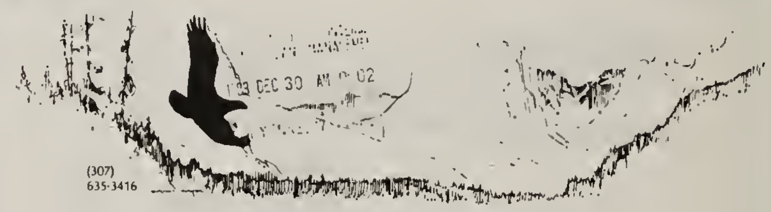
[g] Adjusted to include biomass.

-- = Not applicable.

NA = Not available.

Note: Totals may not sum because of rounding and/or fuel conversion factors used.

4-1



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WYOMING OUTDOOR COUNCIL
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Cheyenne High Plains
Audubon Society

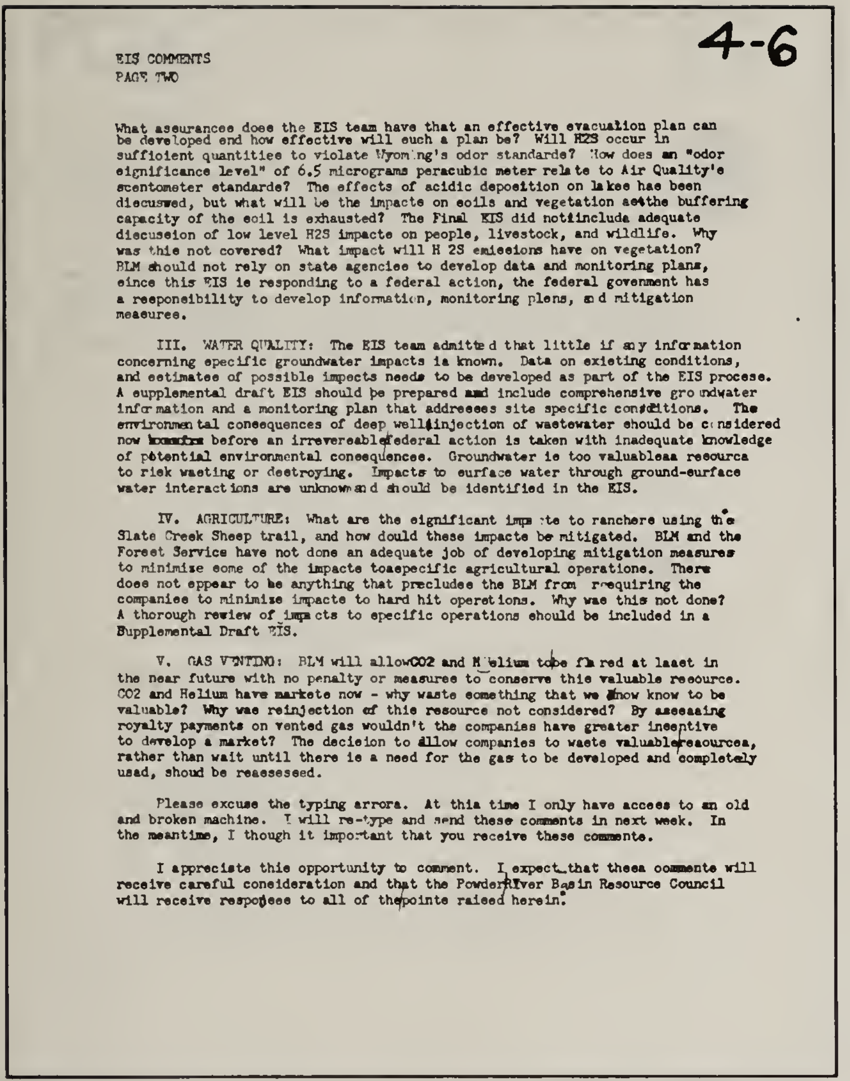
December 29, 1983

Mr. Maxwell T. Lieurance, State Director
Bureau of Land Management
Wyoming State Office
2515 Warren Avenue
Cheyenne, WY 82001

Dear Mr. Lieurance:

The Wyoming Ourdoor Council (WOC) appreciates this opportunity to comment on the Riley Ridge Natural Gas Project Final Environmental Impact Statement. We are submitting partial comments at this time in order to comply with the December 30 deadline; however, we have requested an extension of the comment period on the basis of changes (corrections) in the Air Resources Technical Report which we have not yet had the chance to review. (We requested a copy of the ARTR and errata sheet on December 19.) We would anticipate commenting further after reevaluating the ARTR.

WOC agrees with several commenters on the DEIS that the purpose and need for the project have not been adequately addressed. The response in the FEIS to those assertions indicated that the leaseholders have an indisputable right to develop existing leases; hence, an analysis of the need for the natural gas product is inappropriate, as are discussions of market conditions or energy conservation/energy alternatives. The validity of this argument notwithstanding, we contend that the relative need for the product should determine at least in part the level of development impacts which would be acceptable. We believe that an inordinate number and degree of significant impacts are predicted for the project. In our opinion there would be unacceptable impacts to several resources, most notably wildlife and fisheries, socioeconomics, and air quality related values. Mitigation measures admittedly do not prevent impacts, but in several cases committed mitigation will do little to lessen the severity of impacts. For example,of the 12,115 acres to be disturbed during construction (preferred alternative), 9,053 or 75% is critical wildlife habitat. To exacerbate the situation, the actual number of acres disturbed



4-6

EIS COMMENTS
PAGE TWO

What assurances does the EIS team have that an effective evacuation plan can be developed and how effective will such a plan be? Will H2S occur in sufficient quantities to violate Wyoming's odor standards? How does an "odor significance level" of 6.5 micrograms peracubic meter relate to Air Quality's scentometer standards? The effects of acidic deposition on lakes has been discussed, but what will be the impacts on soils and vegetation asthe buffering capacity of the soil is exhausted? The Final EIS did notinclude adequate discussion of low level H2S impacts on people, livestock, and wildlife. Why was this not covered? What impact will H 2S emissions have on vegetation? BLM should not rely on state agencies to develop data and monitoring plans, since this EIS is responding to a federal action, the federal govenment has a responsibility to develop information, monitoring plans, and mitigation measures.

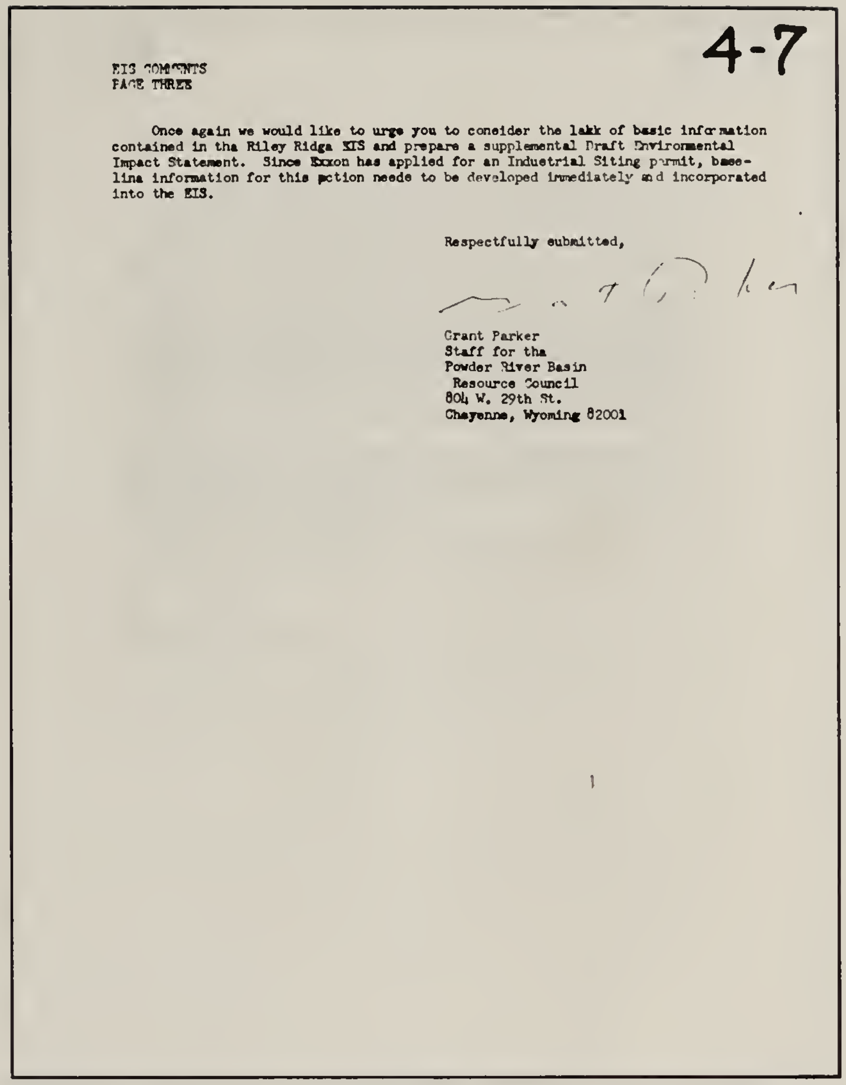
III. WATER QUALITY: The EIS team admitted that little if any information concerning specific groundwater impacts is known. Data on existing conditions, and estimates of possible impacts needs to be developed as part of the EIS process. A supplemental draft EIS should be prepared and include comprehensive groundwater information and a monitoring plan that addresses site specific conditions. The environmental consequences of deep well injection of wastewater should be considered now before an irreversable federal action is taken with inadequate knowledge of potential environmental consequences. Groundwater is too valuable a resource to risk wasting or destroying. Impacts to surface water through ground-surface water interactions are unknown and should be identified in the EIS.

IV. AGRICULTURE: What are the significant impacts to ranchers using the Slate Creek Sheep trail, and how dould these impacts be mitigated. BLM and the Forest Service have not done an adequate job of developing mitigation measures to minimize some of the impacts toaspecific agricultural operations. There does not appear to be anything that precludes the BLM from requiring the companies to minimize impacts to hard hit operations. Why was this not done? A thorough review of impacts to specific operations should be included in a Supplemental Draft EIS.

V. GAS VENTING: BLM will allowCO2 and Helium tobe flared at least in the near future with no penalty or measures to conserve this valuable resource. CO2 and Helium have markets now - why waste something that we know know to be valuable? Why was reinjection of this resource not considered? By assessing royalty payments on vented gas wouldn't the companies have greater incentive to develop a market? The decision to allow companies to waste valuable resources, rather than wait until there is a need for the gas to be developed and completely used, shoud be reassessed.

Please excuse the typing errors. At this time I only have access to an old and broken machine. I will re-type and send these comments in next week. In the meantime, I though it important that you receive these comments.

I appreciate this opportunity to comment. I expect that these comments will receive careful consideration and that the PowderRiver Basin Resource Council will receive responses to all of thepoints raised herein.



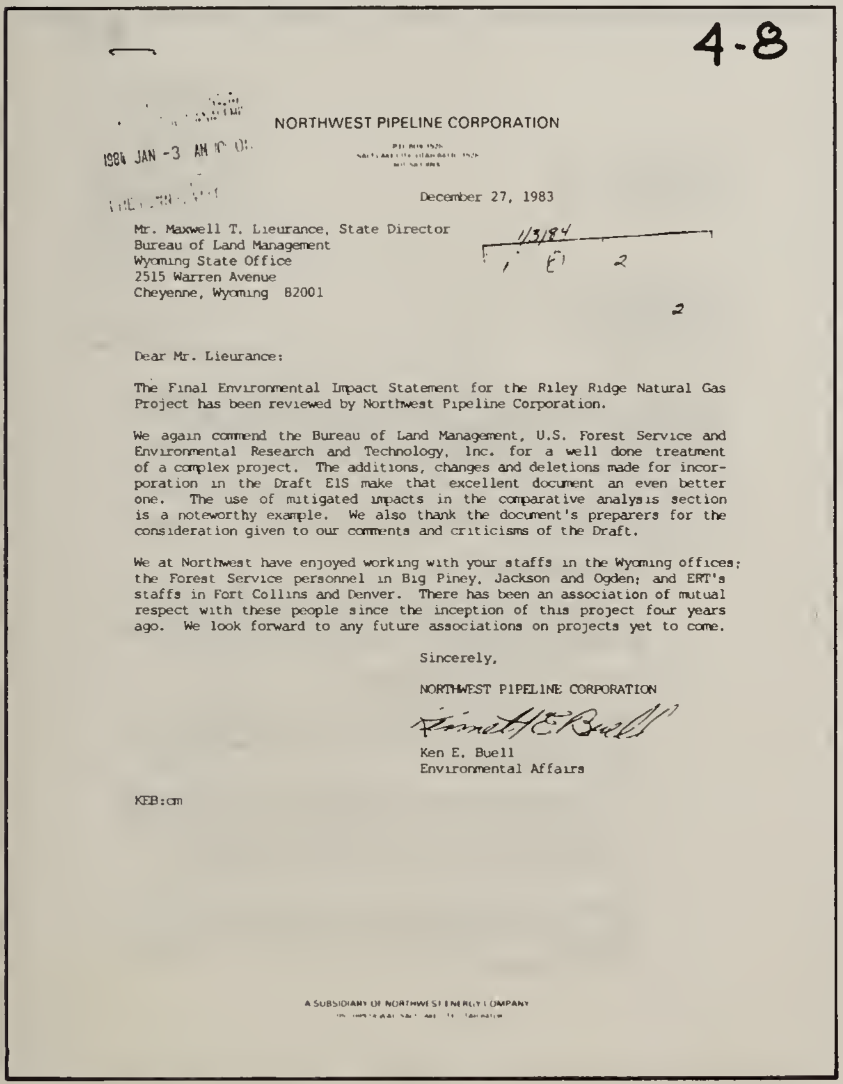
4-7

EIS COMMENTS
PAGE THREE

Once again we would like to urge you to consider the lakk of basic information contained in the Riley Ridge EIS and prepare a supplemental Draft Environmental Impact Statement. Since Exxon has applied for an Industrial Siting permit, baseline information for this action needs to be developed immediately and incorporated into the EIS.

Respectfully submitted,

Grant Parker
Staff for the
Powder River Basin
Resource Council
804 W. 29th St.
Cheyenne, Wyoming 82001



4-8

1984 JAN -3 AM 10

NORTHWEST PIPELINE CORPORATION

December 27, 1983

1/3/84

2

Mr. Maxwell T. Lieurance, State Director
Bureau of Land Management
Wyoming State Office
2515 Warren Avenue
Cheyenne, Wyoming 82001

Dear Mr. Lieurance:

The Final Environmental Impact Statement for the Riley Ridge Natural Gas Project has been reviewed by Northwest Pipeline Corporation.

We again commend the Bureau of Land Management, U.S. Forest Service and Environmental Research and Technology, Inc. for a well done treatment of a complex project. The additions, changes and deletions made for incorporation in the Draft EIS make that excellent document an even better one. The use of mitigated impacts in the comparative analysis section is a noteworthy example. We also thank the document's preparers for the consideration given to our comments and criticisms of the Draft.

We at Northwest have enjoyed working with your staffs in the Wyoming offices; the Forest Service personnel in Big Piney, Jackson and Ogden; and ERT's staffs in Fort Collins and Denver. There has been an association of mutual respect with these people since the inception of this project four years ago. We look forward to any future associations on projects yet to come.

Sincerely,

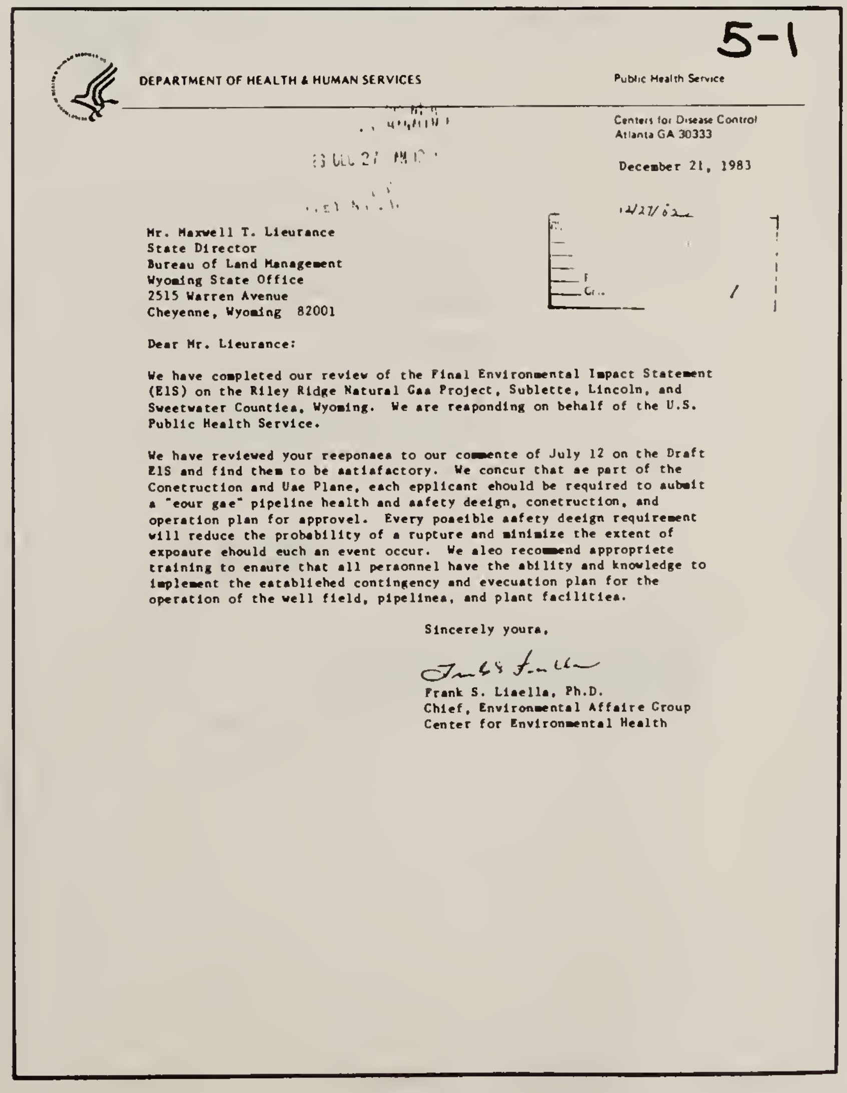
NORTHWEST PIPELINE CORPORATION

Ken E. Buell

Ken E. Buell
Environmental Affairs

KEB:cm

A SUBSIDIARY OF NORTHWEST ENERGY COMPANY



5-1

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30333

83 DEC 27 AM 10

December 21, 1983

12/27/83

Mr. Maxwell T. Lieurance
State Director
Bureau of Land Management
Wyoming State Office
2515 Warren Avenue
Cheyenne, Wyoming 82001

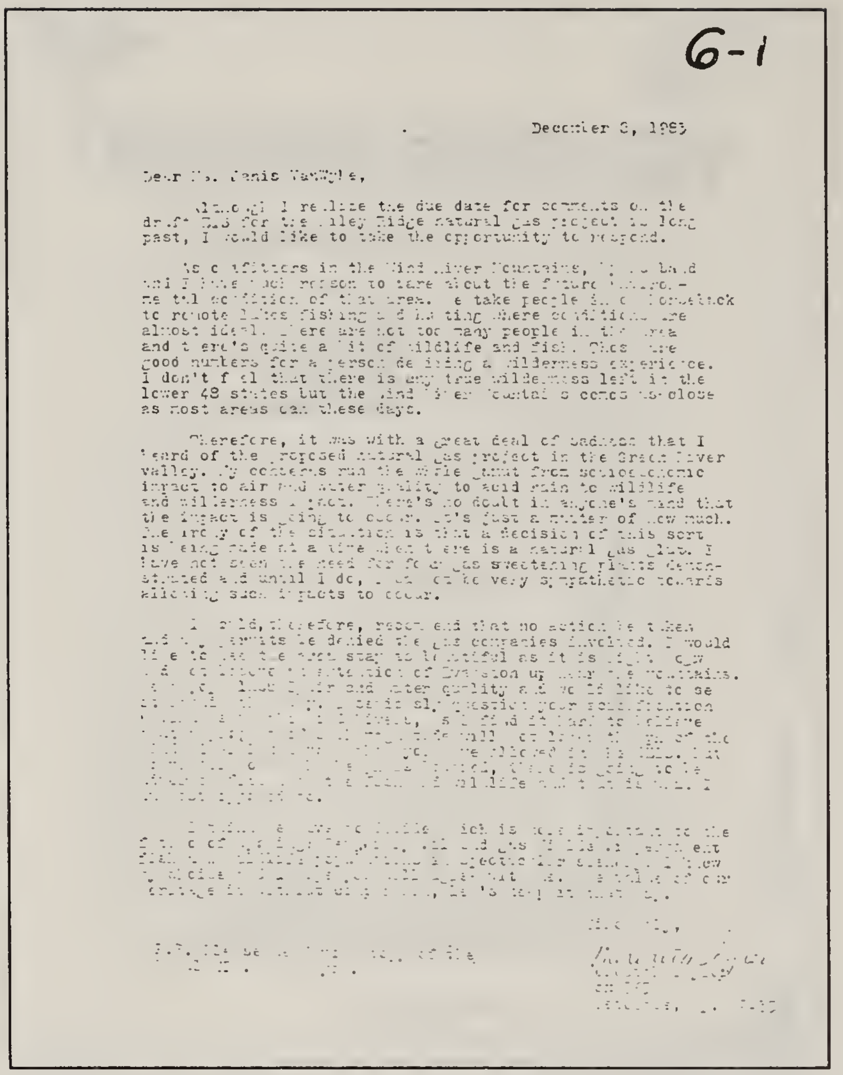
Dear Mr. Lieurance:

We have completed our review of the Final Environmental Impact Statement (EIS) on the Riley Ridge Natural Gas Project, Sublette, Lincoln, and Sweetwater Counties, Wyoming. We are responding on behalf of the U.S. Public Health Service.

We have reviewed your responses to our comments of July 12 on the Draft EIS and find them to be satisfactory. We concur that as part of the Construction and Use Plans, each applicant should be required to submit a "sour gas" pipeline health and safety design, construction, and operation plan for approval. Every possible safety design requirement will reduce the probability of a rupture and minimize the extent of exposure should such an event occur. We also recommend appropriate training to ensure that all personnel have the ability and knowledge to implement the established contingency and evacuation plan for the operation of the well field, pipelines, and plant facilities.

Sincerely yours,

Frank S. Liaella, Ph.D.
Chief, Environmental Affairs Group
Center for Environmental Health



6-1

December 8, 1983

Dear Ms. Janis VanWyhe,

Although I realize the due date for comments on the draft EIS for the Riley Ridge natural gas project is long past, I would like to take the opportunity to respond.

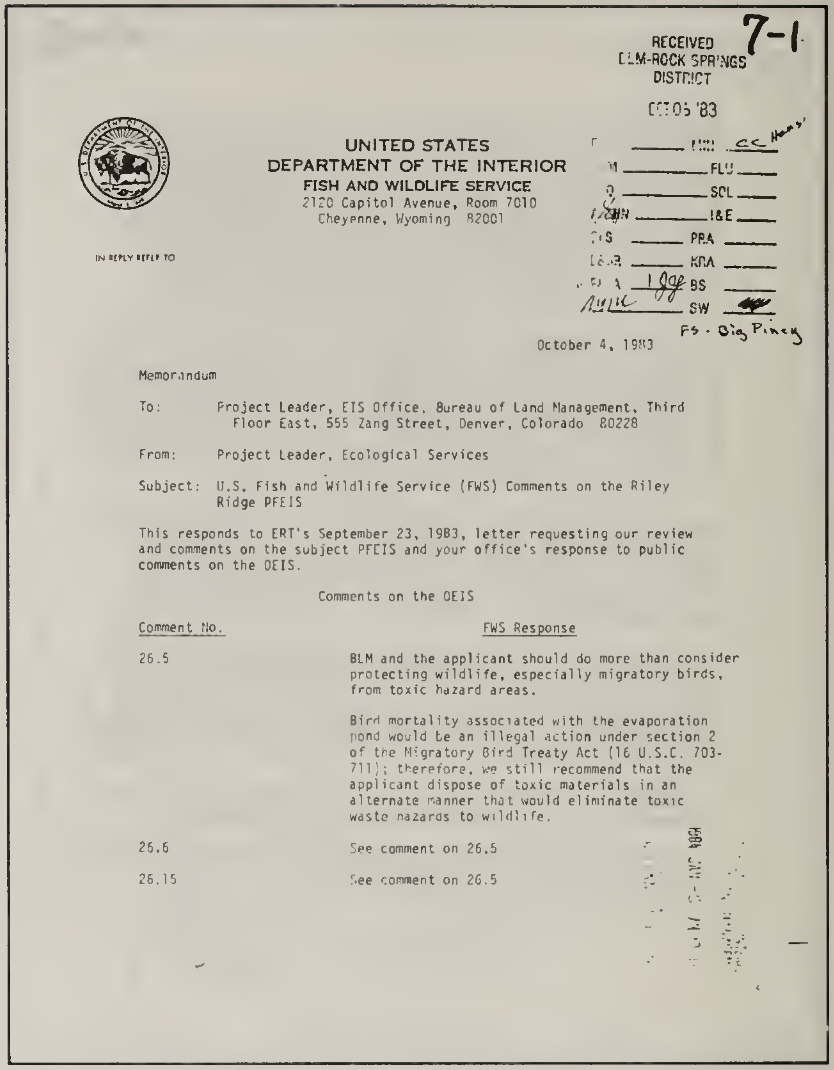
As outfitters in the Wind River Mountains, my husband and I have good reason to care about the future environmental condition of that area. We take people in on horseback to remote lakes fishing and hunting where conditions are almost ideal. There are not too many people in the area and there's quite a bit of wildlife and fish. These are good numbers for a person desiring a wilderness experience. I don't feel that there is any true wilderness left in the lower 48 states but the Wind River Mountains come as close as most areas can these days.

Therefore, it was with a great deal of sadness that I heard of the proposed natural gas project in the Green River valley. My concerns run the whole gamut from socioeconomic impact to air and water quality to acid rain to wildlife and wilderness impact. There's no doubt in anyone's mind that the impact is going to occur. It's just a matter of how much. The irony of the situation is that a decision of this sort is being made at a time when there is a natural gas glut. I have not seen the need for four gas sweetening plants demonstrated and until I do, I can't be very sympathetic towards allowing such impacts to occur.

I would, therefore, recommend that no action be taken and the permits be denied the gas companies involved. I would like to see the area stay as beautiful as it is right now [illegible] up under the mountains. [illegible] air and water quality and would like to see [illegible] question your [illegible] hard to believe [illegible] wildlife [illegible]

[illegible]

[illegible]



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FS - Big Piney

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
2120 Capitol Avenue, Room 7010
Cheyenne, Wyoming 82001

IN REPLY REFER TO

October 4, 1983

Memorandum

To: Project Leader, EIS Office, Bureau of Land Management, Third Floor East, 555 Zang Street, Denver, Colorado 80228

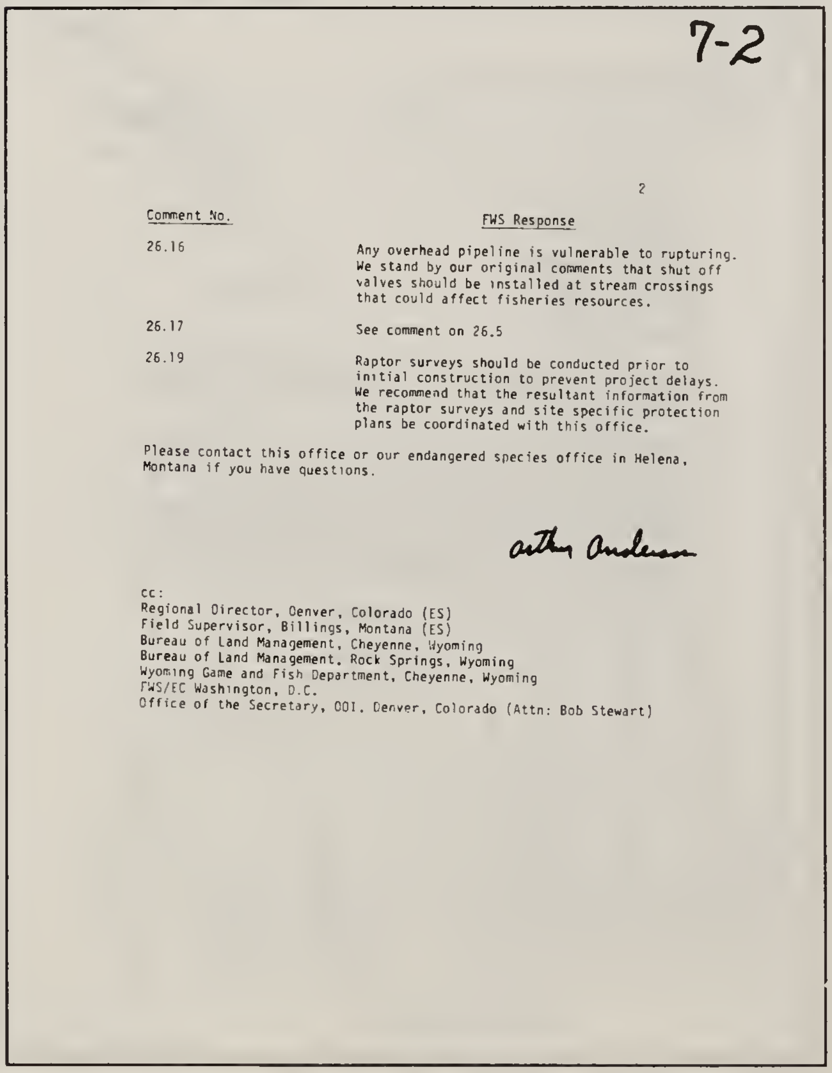
From: Project Leader, Ecological Services

Subject: U.S. Fish and Wildlife Service (FWS) Comments on the Riley Ridge PFEIS

This responds to ERT's September 23, 1983, letter requesting our review and comments on the subject PFEIS and your office's response to public comments on the DEIS.

Comments on the DEIS

Comment No.	FWS Response
26.5	BLM and the applicant should do more than consider protecting wildlife, especially migratory birds, from toxic hazard areas. Bird mortality associated with the evaporation pond would be an illegal action under section 2 of the Migratory Bird Treaty Act (16 U.S.C. 703-711); therefore, we still recommend that the applicant dispose of toxic materials in an alternate manner that would eliminate toxic waste hazards to wildlife.
26.6	See comment on 26.5
26.15	See comment on 26.5



7-2

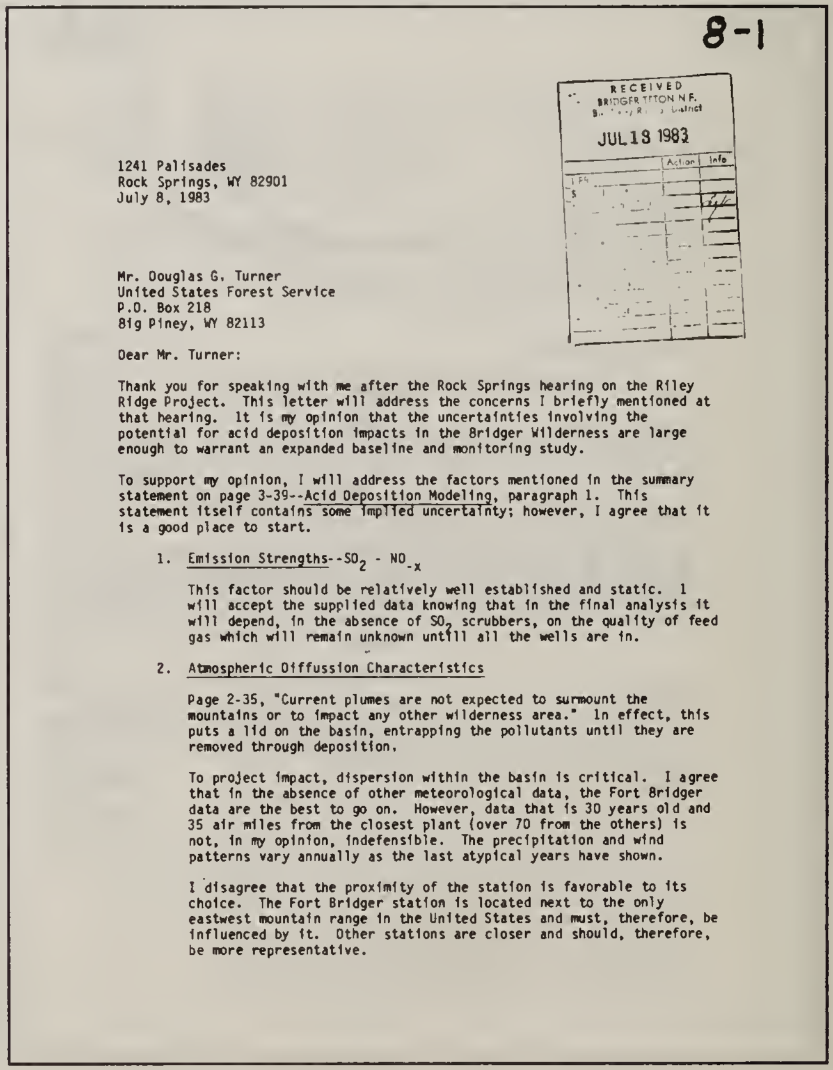
2

Comment No.	FWS Response
26.16	Any overhead pipeline is vulnerable to rupturing. We stand by our original comments that shut off valves should be installed at stream crossings that could affect fisheries resources.
26.17	See comment on 26.5
26.19	Raptor surveys should be conducted prior to initial construction to prevent project delays. We recommend that the resultant information from the raptor surveys and site specific protection plans be coordinated with this office.

Please contact this office or our endangered species office in Helena, Montana if you have questions.

Arthur Anderson

cc:
Regional Director, Denver, Colorado (ES)
Field Supervisor, Billings, Montana (ES)
Bureau of Land Management, Cheyenne, Wyoming
Bureau of Land Management, Rock Springs, Wyoming
Wyoming Game and Fish Department, Cheyenne, Wyoming
FWS/EC Washington, D.C.
Office of the Secretary, DOI, Denver, Colorado (Attn: Bob Stewart)



8-1

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[illegible] District

JUL 18 1983

	Action	Info
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1241 Palisades
Rock Springs, WY 82901
July 8, 1983

Mr. Douglas G. Turner
United States Forest Service
P.O. Box 218
Big Piney, WY 82113

Dear Mr. Turner:

Thank you for speaking with me after the Rock Springs hearing on the Riley Ridge Project. This letter will address the concerns I briefly mentioned at that hearing. It is my opinion that the uncertainties involving the potential for acid deposition impacts in the Bridger Wilderness are large enough to warrant an expanded baseline and monitoring study.

To support my opinion, I will address the factors mentioned in the summary statement on page 3-39--Acid Deposition Modeling, paragraph 1. This statement itself contains some implied uncertainty; however, I agree that it is a good place to start.

1. Emission Strengths--SO_2 - NO_{-x}

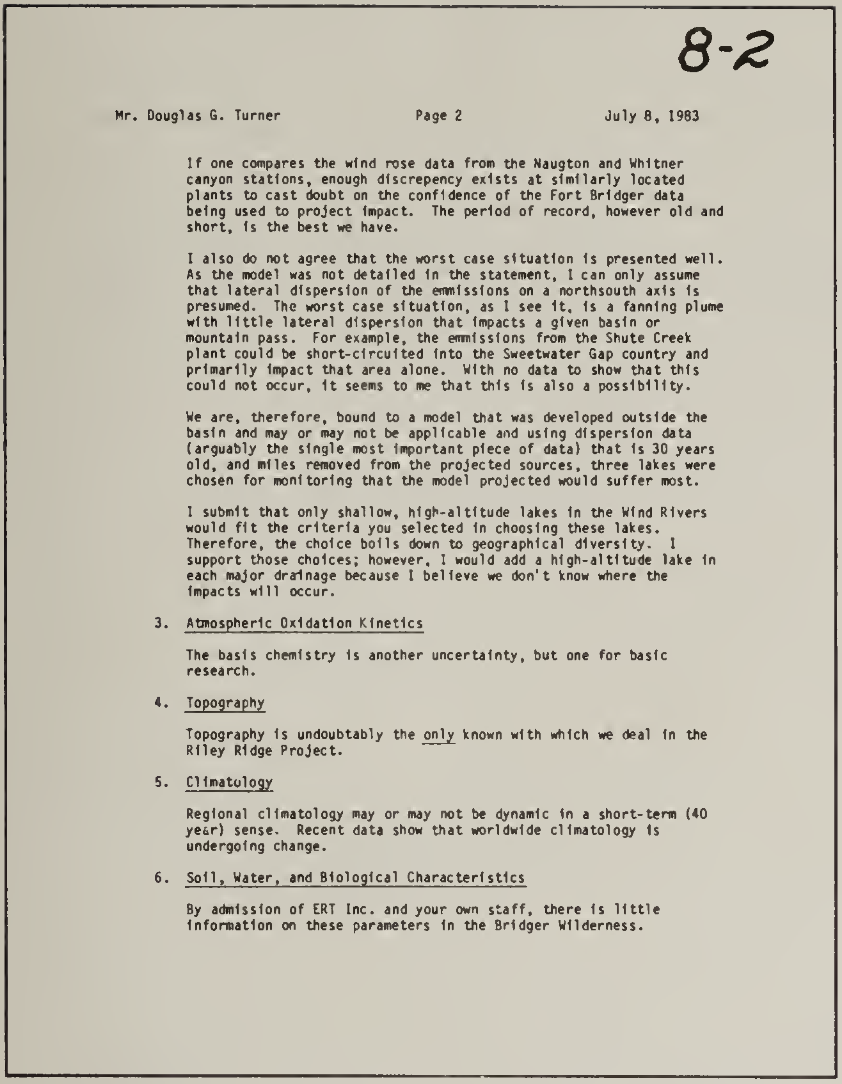
   This factor should be relatively well established and static. I will accept the supplied data knowing that in the final analysis it will depend, in the absence of SO_2 scrubbers, on the quality of feed gas which will remain unknown untill all the wells are in.

2. Atmospheric Diffussion Characteristics

   Page 2-35, "Current plumes are not expected to surmount the mountains or to impact any other wilderness area." In effect, this puts a lid on the basin, entrapping the pollutants until they are removed through deposition.

   To project impact, dispersion within the basin is critical. I agree that in the absence of other meteorological data, the Fort Bridger data are the best to go on. However, data that is 30 years old and 35 air miles from the closest plant (over 70 from the others) is not, in my opinion, indefensible. The precipitation and wind patterns vary annually as the last atypical years have shown.

   I disagree that the proximity of the station is favorable to its choice. The Fort Bridger station is located next to the only eastwest mountain range in the United States and must, therefore, be influenced by it. Other stations are closer and should, therefore, be more representative.



8-2

If one compares the wind rose data from the Naugton and Whitner canyon stations, enough discrepency exists at similarly located plants to cast doubt on the confidence of the Fort Bridger data being used to project impact. The period of record, however old and short, is the best we have.

I also do not agree that the worst case situation is presented well. As the model was not detailed in the statement, I can only assume that lateral dispersion of the emmissions on a northsouth axis is presumed. The worst case situation, as I see it, is a fanning plume with little lateral dispersion that impacts a given basin or mountain pass. For example, the emmissions from the Shute Creek plant could be short-circuited into the Sweetwater Gap country and primarily impact that area alone. With no data to show that this could not occur, it seems to me that this is also a possibility.

We are, therefore, bound to a model that was developed outside the basin and may or may not be applicable and using dispersion data (arguably the single most important piece of data) that is 30 years old, and miles removed from the projected sources, three lakes were chosen for monitoring that the model projected would suffer most.

I submit that only shallow, high-altitude lakes in the Wind Rivers would fit the criteria you selected in choosing these lakes. Therefore, the choice boils down to geographical diversity. I support those choices; however, I would add a high-altitude lake in each major drainage because I believe we don't know where the impacts will occur.

3. Atmospheric Oxidation Kinetics

   The basis chemistry is another uncertainty, but one for basic research.

4. Topography

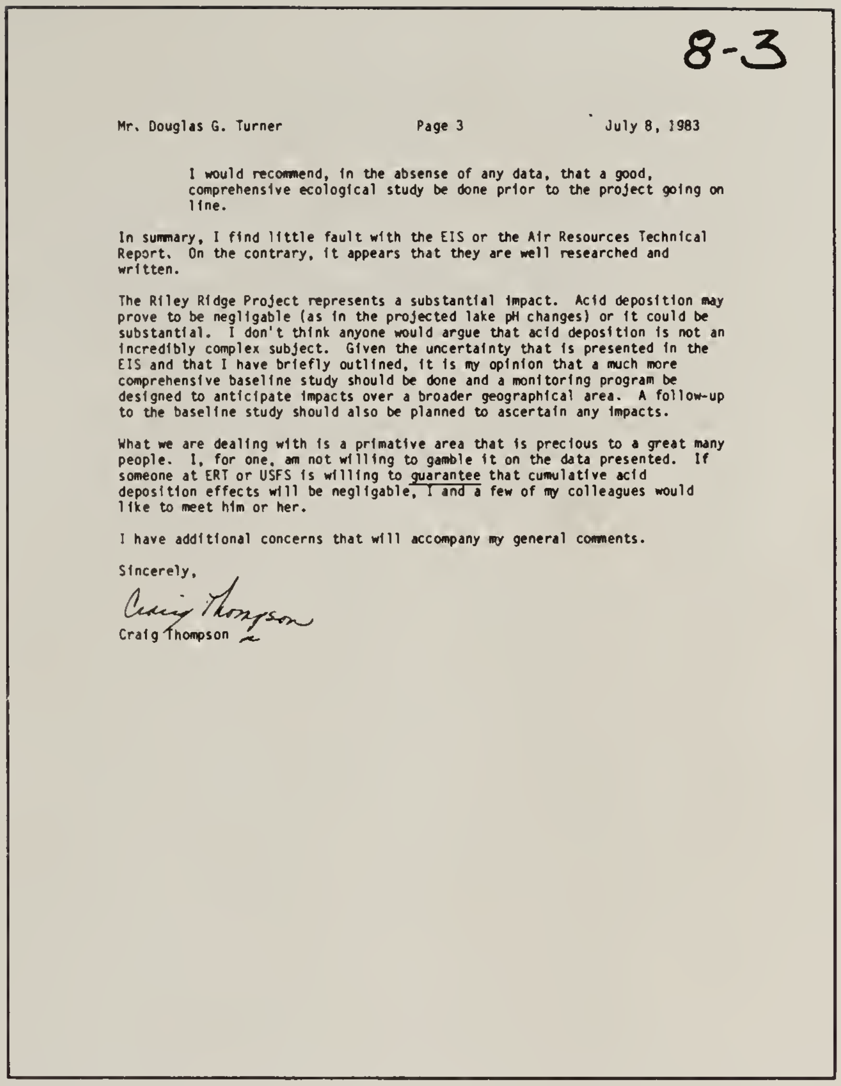
   Topography is undoubtably the only known with which we deal in the Riley Ridge Project.

5. Climatology

   Regional climatology may or may not be dynamic in a short-term (40 year) sense. Recent data show that worldwide climatology is undergoing change.

6. Soil, Water, and Biological Characteristics

   By admission of ERT Inc. and your own staff, there is little information on these parameters in the Bridger Wilderness.



8-3

I would recommend, in the absense of any data, that a good, comprehensive ecological study be done prior to the project going on line.

In summary, I find little fault with the EIS or the Air Resources Technical Report. On the contrary, it appears that they are well researched and written.

The Riley Ridge Project represents a substantial impact. Acid deposition may prove to be negligable (as in the projected lake pH changes) or it could be substantial. I don't think anyone would argue that acid deposition is not an incredibly complex subject. Given the uncertainty that is presented in the EIS and that I have briefly outlined, it is my opinion that a much more comprehensive baseline study should be done and a monitoring program be designed to anticipate impacts over a broader geographical area. A follow-up to the baseline study should also be planned to ascertain any impacts.

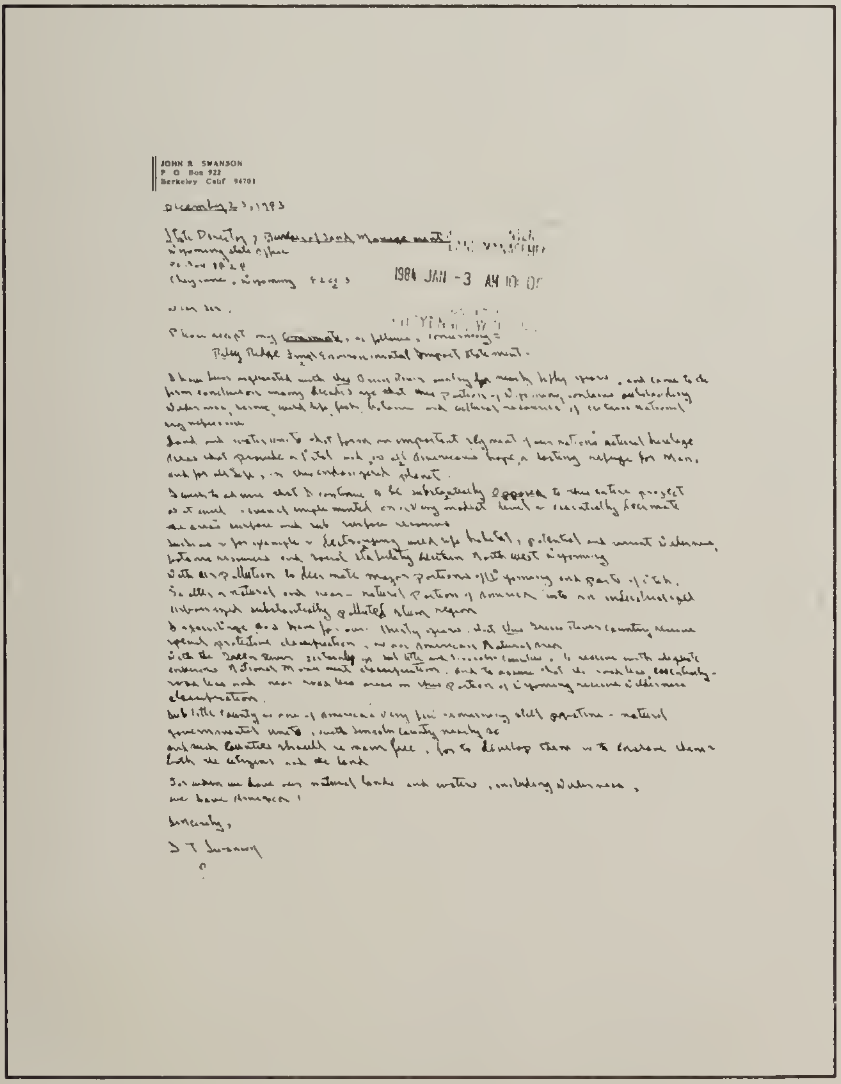
What we are dealing with is a primative area that is precious to a great many people. I, for one, am not willing to gamble it on the data presented. If someone at ERT or USFS is willing to guarantee that cumulative acid deposition effects will be negligable, I and a few of my colleagues would like to meet him or her.

I have additional concerns that will accompany my general comments.

Sincerely,

Craig Thompson

Craig Thompson



JOHN R. SWANSON
P. O. Box 922
Berkeley Calif 94701

State Director, Bureau of Land Management
Wyoming State Office
P.O. Box 1828
Cheyenne, Wyoming 82003

1984 JAN -3 AM 10: 05

Dear Sir,

Please accept my comments, as follows, concerning:
Riley Ridge Final Environmental Impact Statement.

Sincerely,

ATTACHMENT F
MAPS

Map S-1 - Riley Ridge Natural Gas Project Record Of Decision (North 1/2).

Map S-2 - Riley Ridge Natural Gas Project Record Of Decision (South 1/2).

Map 1 - Sour Gas Trunk Line - Proposed And Alternative Assignments.

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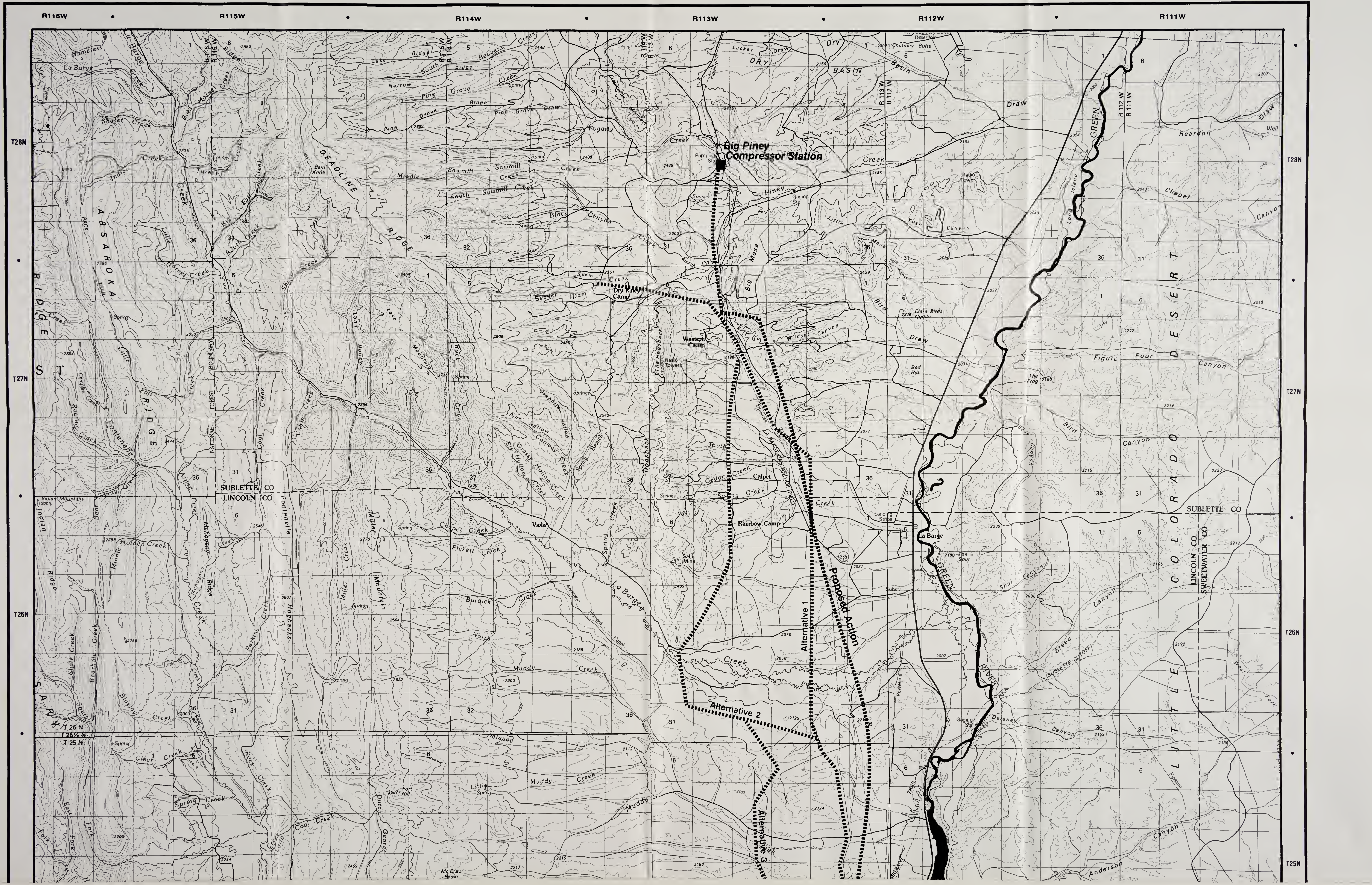
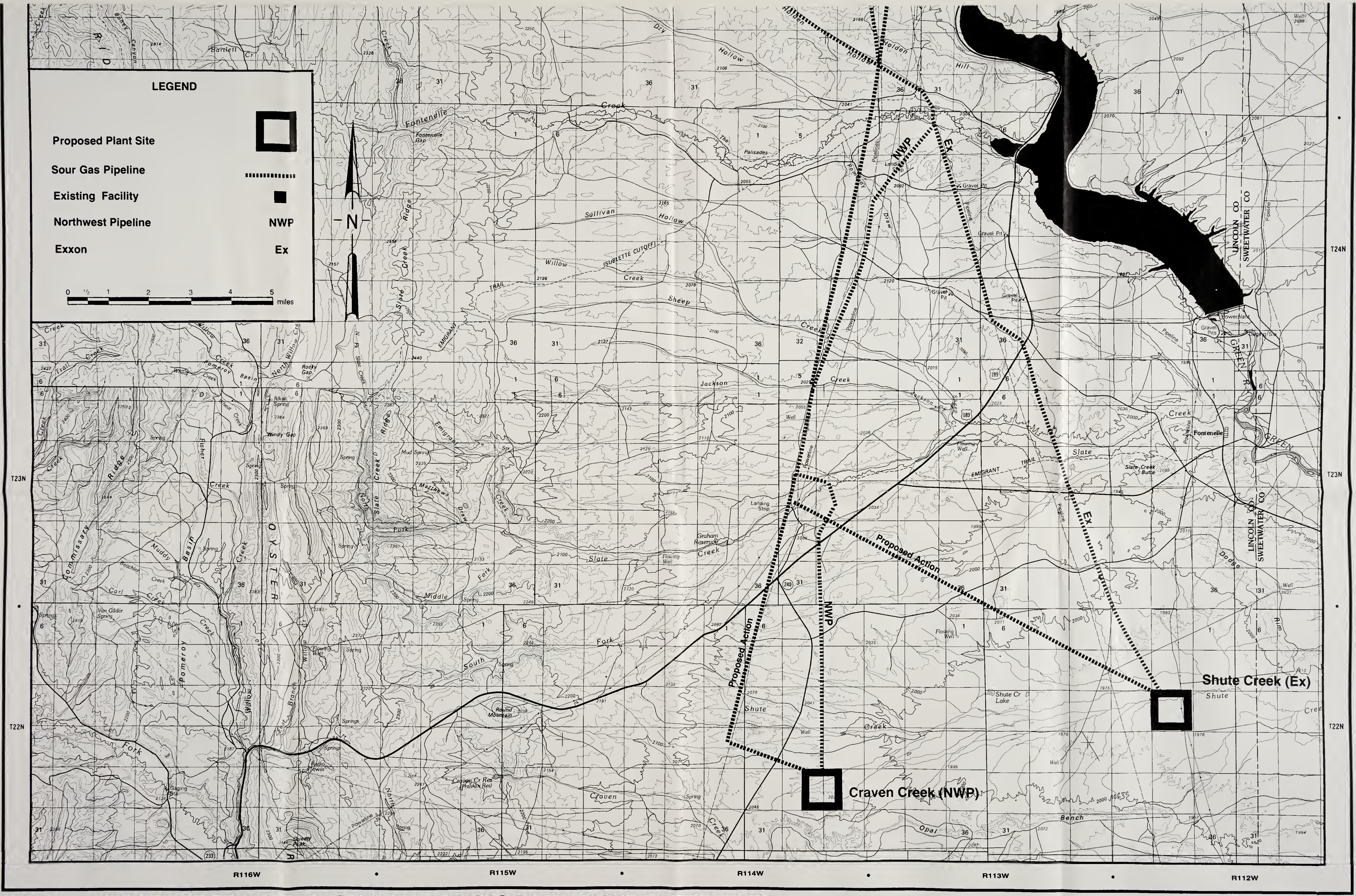

R116W
R115W
R114W
R113W
R112W
R111W
T28N
T27N
T26N
T25N
T 26 N
T 25½ N
T 25 N
Big Piney Compressor Station
Pumping Sta
Dry Piney Camp
Western Camp
Calpet
Rainbow Camp
La Barge
Viola
Proposed Action
Alternative 1
Alternative 2
Alternative 3
DRY BASIN
DEADLINE RIDGE
ABSAROKA RIDGE
COLORADO DESERT
LITTLE COLORADO DESERT
GREEN RIVER
SUBLETTE CO
LINCOLN CO
SWEETWATER CO
NATIONAL FOREST BOUNDARY
La Barge Creek
Fontenelle Creek
Muddy Creek
North Muddy Creek
Dry Piney Creek
South Piney Creek
Middle Piney Creek
Sawmill Creek
Black Canyon
Beaver Dam
Big Mesa
The Hogback
Hogsback Ridge
Wildcat Canyon
Birds Draw
Clara Birds Nipple
Red Hill
Figure Four Canyon
Bird Canyon
The Frog
Chapel Canyon
Reardon Draw
Yose Canyon
Long Island
Chimney Butte
Lackey Draw
Pine Grove Ridge
Narrow Ridge
Fogarty Creek
Cedar Creek
Spring Creek
Salt Mine
Subeta
Landing Strips
Spur Canyon
The Spur
Steed Canyon
(SUBLETTE CUTOFF)
Delaney Canyon
Anderson Canyon
Gaging Sta
Radio Towers
Chapel Creek
Pickett Creek
Burdick Creek
Hobbacks
Miller Creek
Miller Mountain
Dutch George
Mc Cray Basin
Little Spring
Fort Hill
Coal Creek
Clear Creek
Rock Creek
Holden Creek
Indian Mountain
Fontenelle Creek
Roaring Creek
Pack Trail
LA BARGE GAS AND OIL FIELD
Viola
Powerline
Pipeline
235
Nameless
La Barge
Shafer Creek
Bald Knoll
Graphite Hollow
Conway Creek
Grassy Hollow
Elk Hollow
Dry Piney Camp
Springs



MAP 1 RILEY RIDGE PROJECT - PROPOSED SOUR GAS PIPELINE AND ALTERNATIVES

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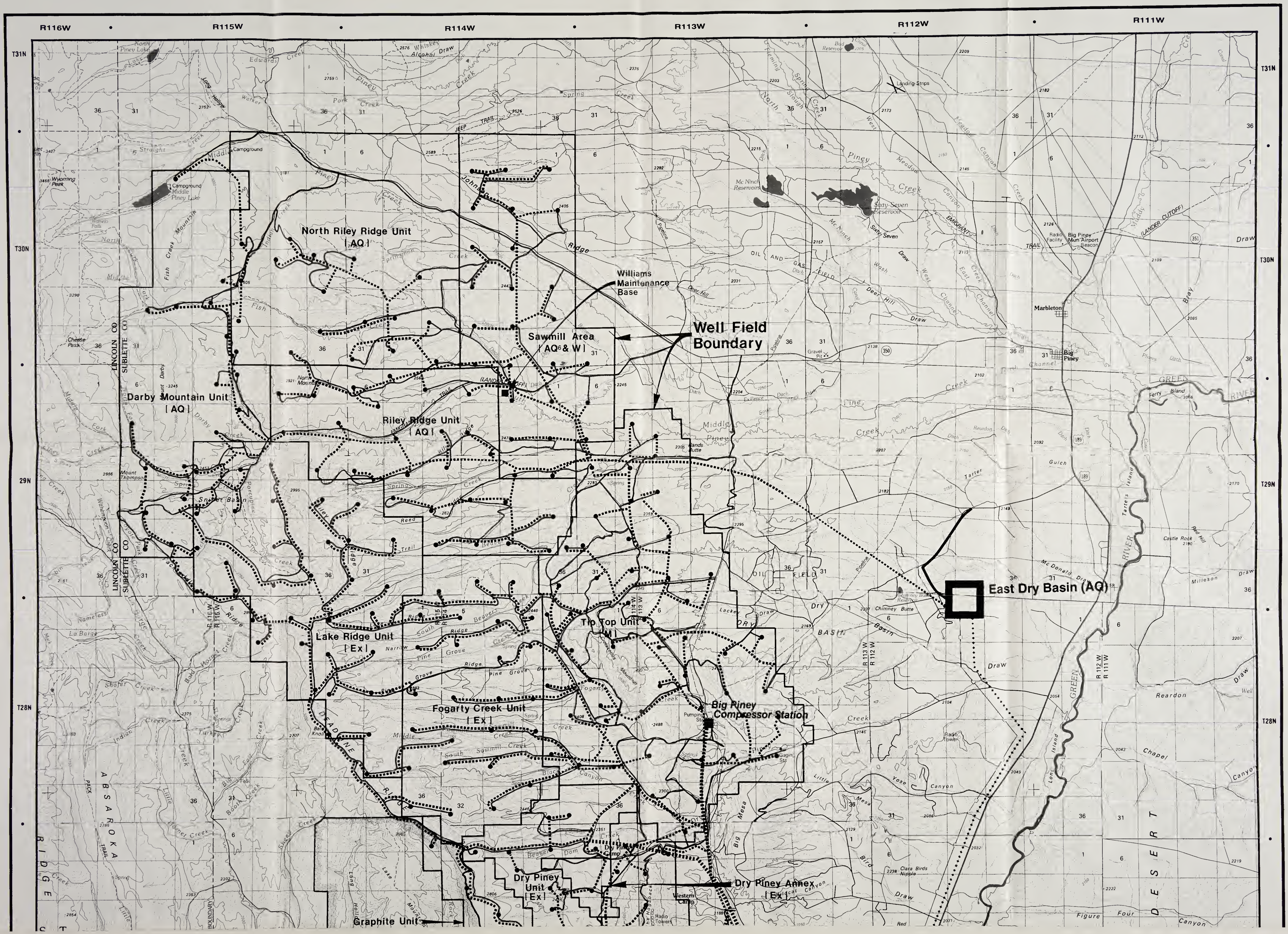
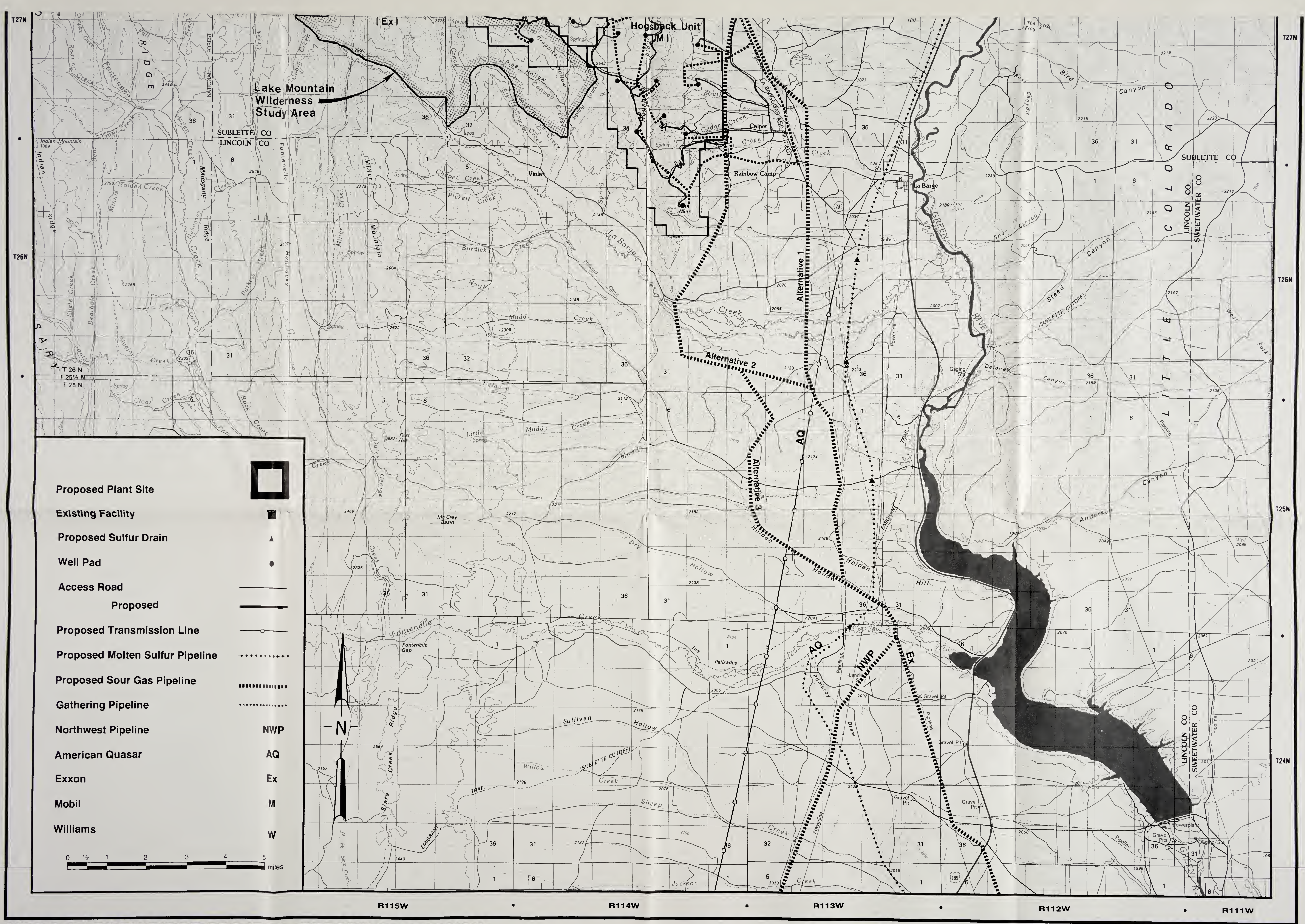


R116W
R115W
R114W
R113W
R112W
R111W
T31N
T30N
29N
T28N
North Riley Ridge Unit
[AQ]
Williams Maintenance Base
Sawmill Area
[AQ & W]
Well Field Boundary
Darby Mountain Unit
[AQ]
Riley Ridge Unit
[AQ]
East Dry Basin (AQ)
Tip Top Unit
[M]
Lake Ridge Unit
[Ex]
Fogarty Creek Unit
[Ex]
Big Piney Compressor Station
Dry Piney Unit
[Ex]
Dry Piney Annex
[Ex]
Graphite Unit
LINCOLN CO
SUBLETTE CO
Middle Piney Lake
Wyoming Peak
Mc Ninch Reservoirs
Sixty-Seven Reservoir
Marbleton
Big Piney
Radio Facility
Big Piney Mun Airport Beacon
Landing Strips
OIL AND GAS FIELD
OIL FIELD
GREEN RIVER
Chimney Butte
Dry Basin
ABSAROKA RIDGE
DESERT
Deadline Ridge
Mount Thompson
North Mountain
Darby Mountain
Snider Basin
Sands Butte
Castle Rock
Clara Birds Nipple
Radio Tower
Radio Towers
Western Camp
Dry Piney Camp
EMIGRANT TRAIL
(LANDER CUTOFF)
JEEP TRAIL
Piney Creek
Middle Piney Creek
South Piney Creek
Fish Creek
Beaver Creek
Fogarty Creek
Sawmill Creek
Black Canyon
Figure Four Canyon
Chapel Canyon
Reardon Draw
Tarter Gulch
Yose Canyon
Little Mesa
Big Mesa
Bird Canyon
Cheese Pass
Nameless
La Barge
Shafer Creek
Indian Creek
Long Hollow
Straight Creek
Edwards Creek
Whiskey Alcohol Draw
Deer Hill
Mc Donald Draw
Milleson Draw
Ferry Island
Lone Island
Tarter Island
Red Hill
R 116 W
R 115 W
R 113 W
R 112 W
R 111 W
350
351
189



MAP S-1 RILEY RIDGE PROJECT - RECORD OF DECISION (North ½)

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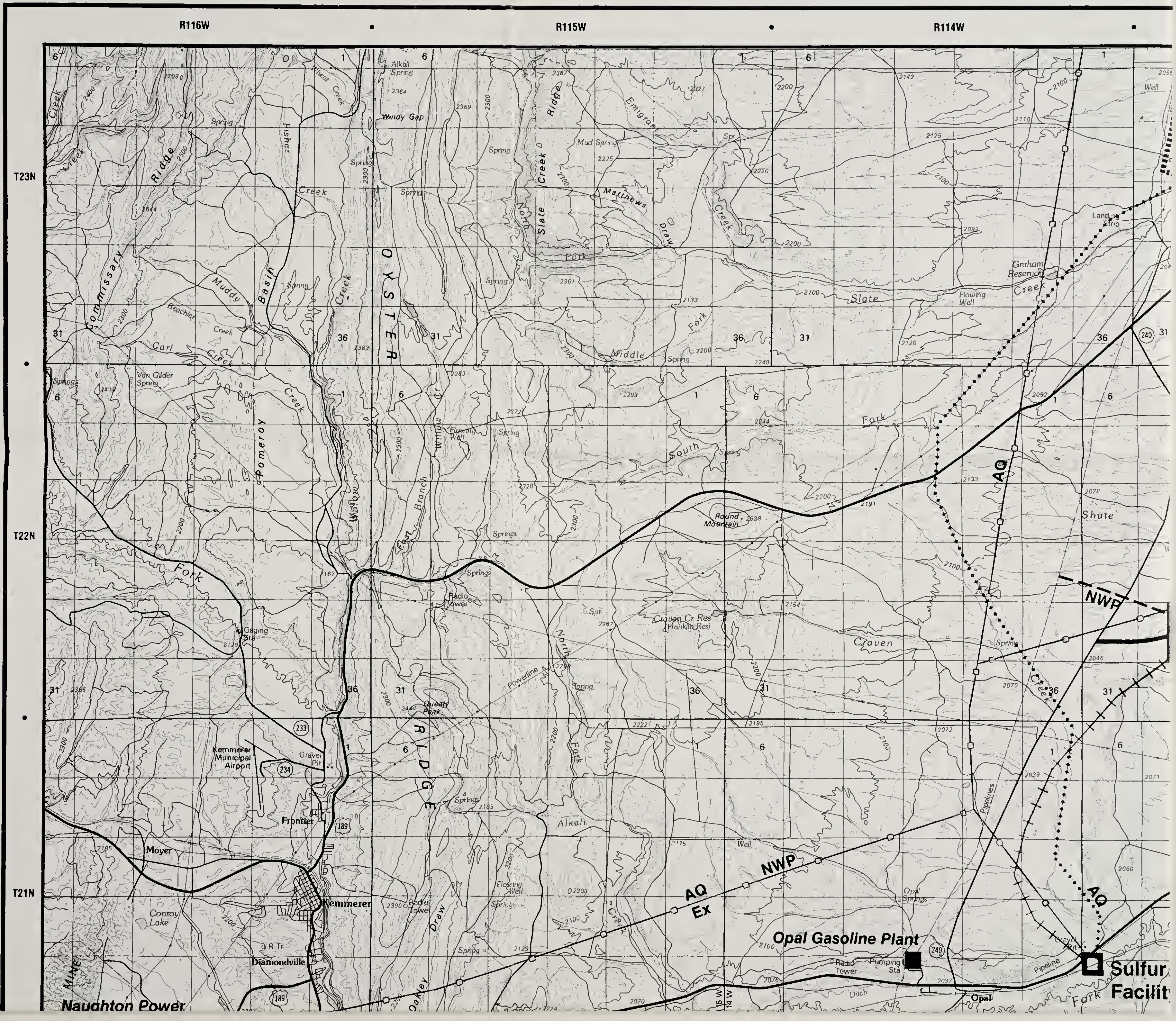
R116W
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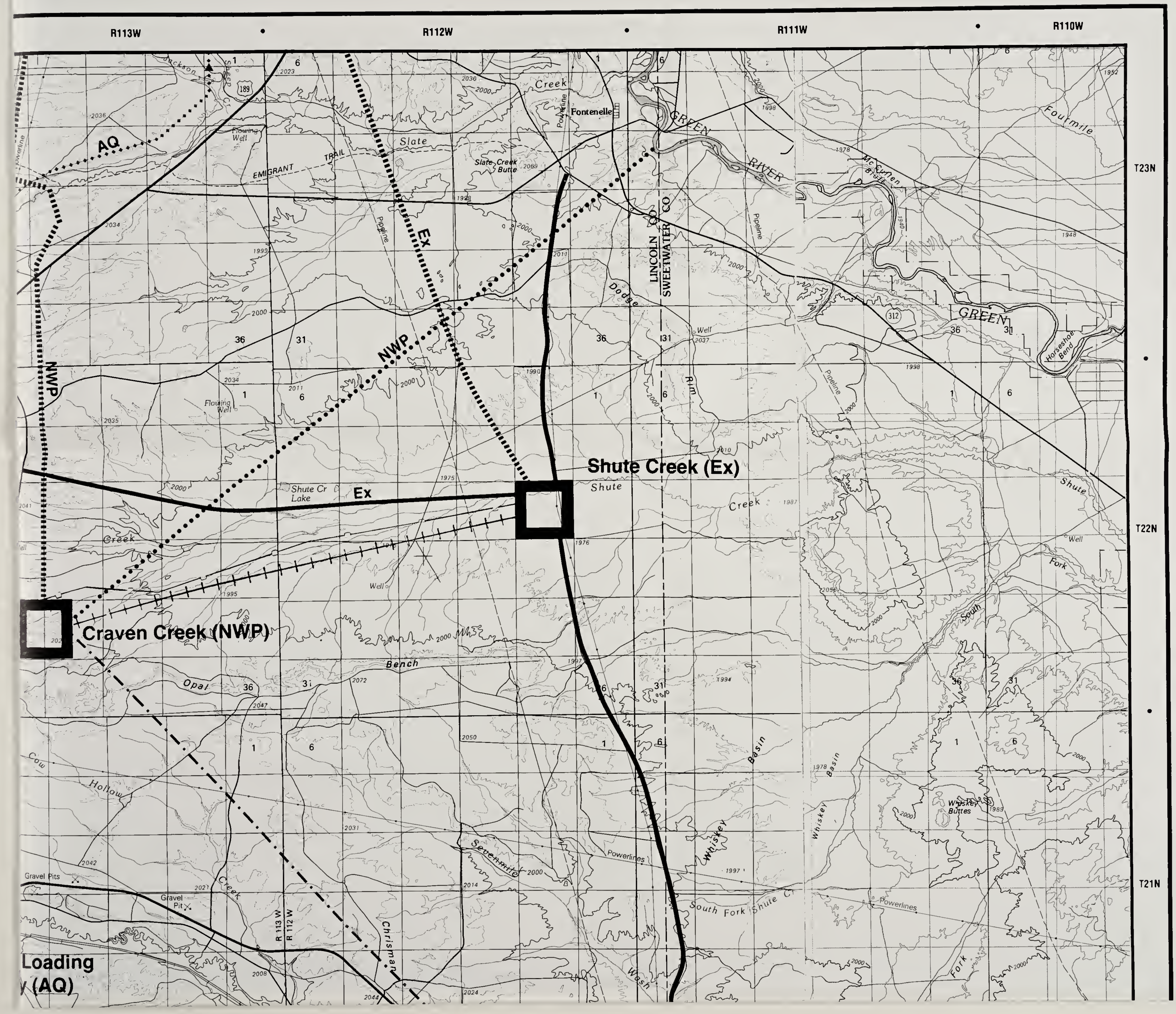
T21N
Alkali Spring
Windy Gap
Wheat Creek
Fisher Creek
Commissary Ridge
Muddy Basin
Beachler Creek
Carl Creek
Van Gilder Spring
Pomeroy Creek
OYSTER RIDGE
Willow Creek
Willow Cr
East Branch
North Slate Creek Ridge
Emigrant
Mud Spring
Matthews Draw
Slate Creek
Middle Fork
South Fork
Graham Reservoir
Landing Strip
Flowing Well
Round Mountain
Craven Cr Res (Franklin Res)
Craven Creek
Shute
Radio Tower
Powerline
Quealy Peak
North Fork
Alkali
Gaging Sta
Fork
Kemmerer Municipal Airport
Gravel Pit
Frontier
Moyer
Kemmerer
Conroy Lake
Diamondville
R R Tr
MINE
Naughton Power
Oakley Draw
Opal Gasoline Plant
Opal Springs
Radio Tower
Pumping Sta
Opal
Ditch
Pipeline
Pipelines
Gravel Pit
Sulfur Facility
AQ
NWP
AQ Ex
233
234
189
240
Springs
Spring
Well


R113W
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T23N
T22N
T21N
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NWP
Ex
EMIGRANT TRAIL
Slate
Slate Creek Butte
Creek
Fontenelle
GREEN RIVER
GREEN
McCullen Bluffs
Fourmile
Horseshoe Bend
LINCOLN CO
SWEETWATER CO
Dodge
Rim
Pipeline
Powerline
Flowing Well
Well
Shute Creek (Ex)
Shute
Creek
Shute Cr Lake
Shute Fork
South
Craven Creek (NWP)
Opal
Bench
Cow Hollow
Sevenmile Creek
Chrisman
Powerlines
Whiskey Basin
Whiskey Buttes
Whiskey Wash
South Fork Shute Cr
Fork
Gravel Pits
Gravel Pit
R 113 W
R 112 W
Loading
(AQ)
Jackson
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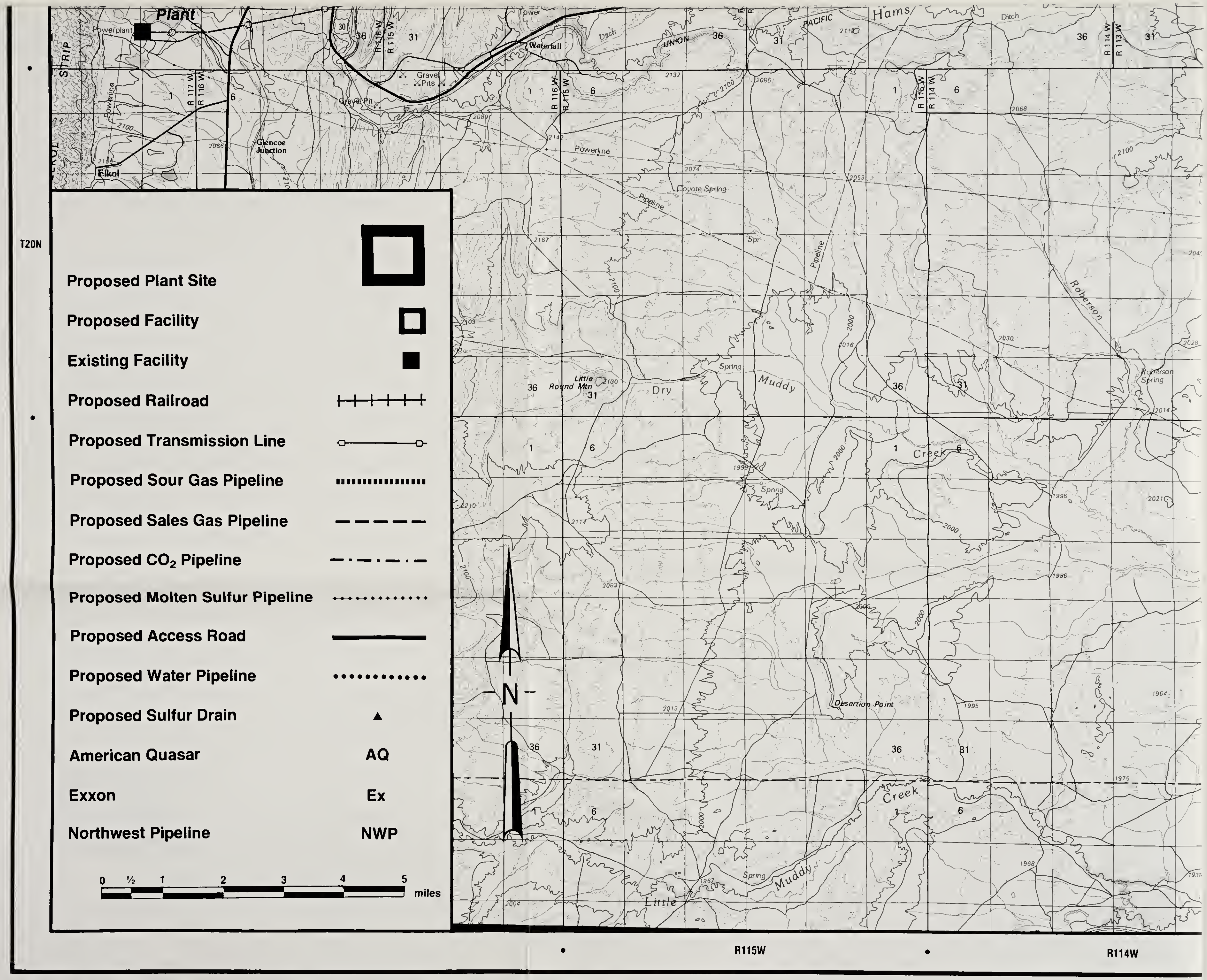
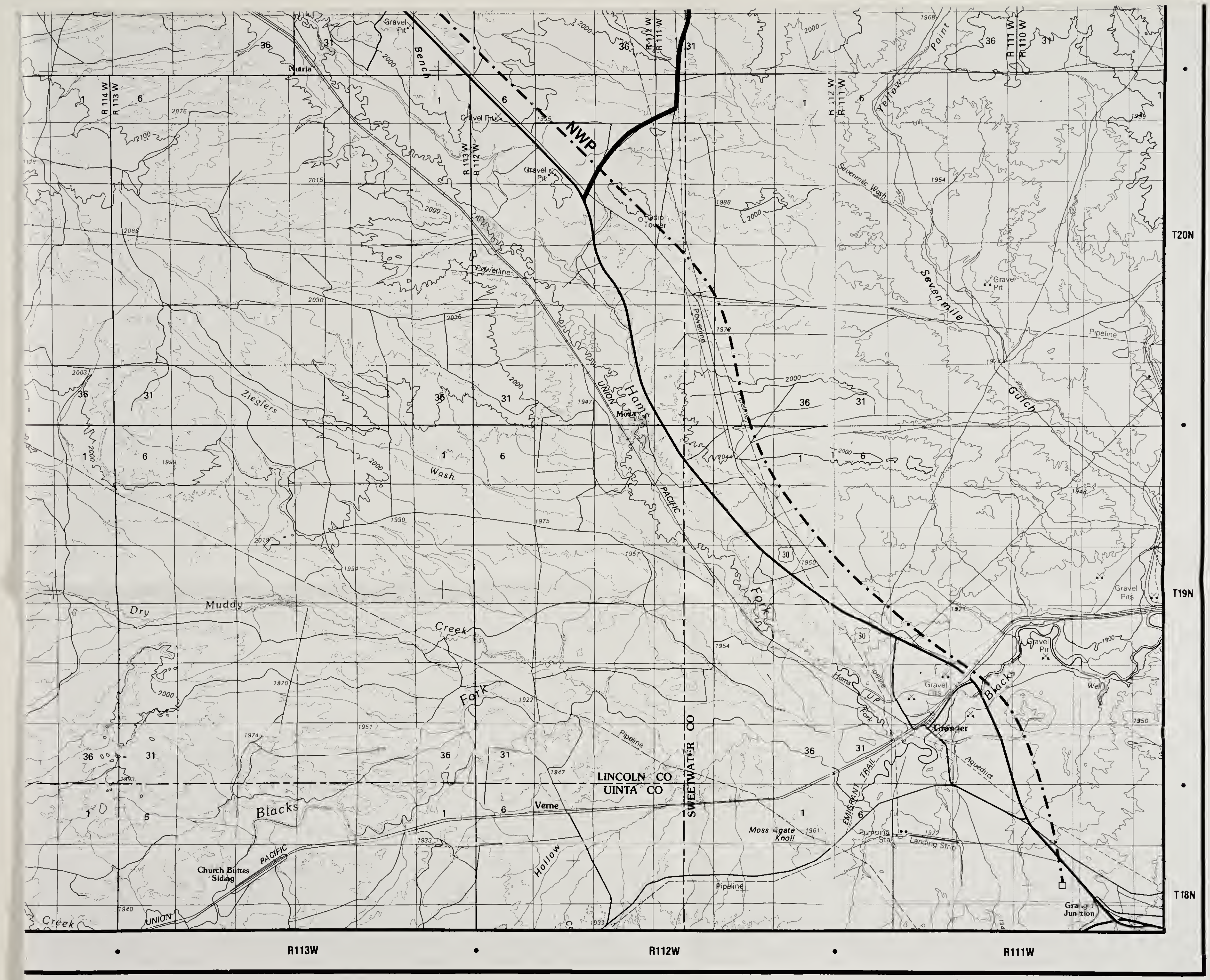


MAP S-2 RILEY RIDGE PROJECT - RECORD OF DECISION (South ½)



Riley Ridge Project

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